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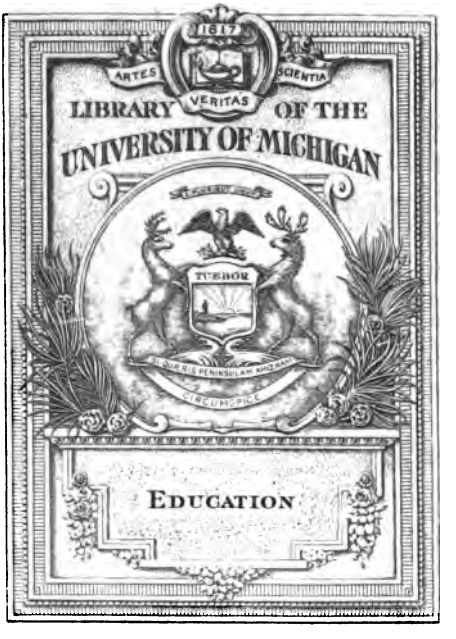
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THE CHILD

HIS THINKING, FEELING, AND DOING

By
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Lecturer in Children's Institute
Clark University

With an Introduction by
G. STANLEY HALL

Revised and
enlarged edition

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THE PREFACE

IN working over the mass of material which has accumulated on child study, I have been most impressed by the fact that even now so few general laws can be formulated about child nature. The material is still in a chaotic state, and seems destined to remain so for some time, because the reports from different authorities are so conflicting. In many cases the conflict is doubtless due to different conditions of observation; but in other cases it is due to differences in children resulting from heredity and nationality, or from surroundings—homes, food, and education. I therefore appreciate the fact that some of the observations given here will be seriously modified by later ones. I do not necessarily defend the observations which I cite; I only present the most reliable and leave them for confirmation or rebuttal.

On this account, I have not attempted to draw many general conclusions, or to work out any complete educational theory. I have aimed rather to bring together under one cover a summary of the important work done thus far in child study, so that the teacher and mother who have little access to libraries may understand something of what the condition of the subject is, and may, if so disposed, contribute toward filling up its gaps. This side of the matter is the more prominent in my own mind because the book is the direct outcome of the difficulties which I met in teaching the subject to my classes in the University College of the University of Chicago. There seemed to be a need

for a book which should give a résumé of observations which at that time were to be obtained only in all sorts of magazines and books, and which were yet necessary to an understanding of the subject. Such a book would also, it seemed to me, furnish something of the perspective which is necessarily lacking in scattered reading, would serve as a stimulus to more careful study of the children with whom we deal every day, and would aid in preparing the soil for a better educational theory than at present prevails.

Although lacking in theory, the book should still serve as a background upon which to sketch in details of the child whom we know best. In the study of one child or of a few children, to which most of us are limited, we are rather prone to conclude that characteristics which are in truth peculiar to the little group known to us belong to all children. A knowledge of these wider observations will prevent such errors and will lead to more careful study.

Grateful acknowledgment is hereby made to Dr. Stuart H. Rowe, Lecturer on Pedagogy at Yale University, who read the manuscript of this book and made many valuable suggestions; to the *Pedagogical Seminary* for permission to reproduce the charts found on pages 411 and 502; to the *Elementary School Record* for permission to quote from Mrs. May Root Kern's article on Song Composition, and to the many authors whose works I have consulted freely.

AMY ELIZA TANNER.

December, 1903.

PREFACE TO THE REVISED EDITION

IN going over the child-study literature of the last ten years, what most impresses one is the fact that the formerly somewhat shapeless material is arranging itself into specialized and technical aspects. Some of these cannot be discussed in this book, but should be at least briefly referred to here. School hygiene, including medical inspection of schools, is now almost a separate subject, with its own literature, journal, and congress. Almost the same is true of the study of defective children, though this is closely bound up on one side with studies in heredity and on another with the problem of tests and standards of intelligence. The latter is itself one of the most complex and important of recent developments. Many practical benefits wait for the discovery of trustworthy tests, such as the treatment of juvenile delinquents, vocational guidance, and the encouragement of talent, to say nothing of the separation in school of subnormal from normal children. Again, there is a considerable body of literature on the methods of collecting and using data, the best ways of presenting data in curves, tables, and figures, and so on. Experimental pedagogy is another phase, though its boundaries are still not clearly defined. In general it is the application to teaching of the accredited results of child study, and its fundamental motivation is to clear the way in our schools for the normal learning process in all subjects, instead of forcing the child's mind to take the roundabout and wasteful routes so often demanded now. When it is fully developed it

will take the place of the old courses in "methods" — and indeed it is already doing this in places not a few. Still other phases with journals and a large literature are sex hygiene and instruction, play and playgrounds, and moral and religious education.

It is evident from the above that a book like this cannot attempt to deal with all these sides of child study. It has seemed to me, therefore, that the best that could be done for the beginners for whom this book is intended is to supply certain standard references which would open to them the literature on all these subjects, and to discuss in the book itself those subjects which seem most suitable for a first book.

Among the many valuable studies which have appeared since 1904, when the first edition of this book was published, the chief source books in English are Dr. G. Stanley Hall's volumes on *Adolescence* and *Problems of Education*. In German the second edition of Meumann's *Vorlesungen* (2 vols., approximately 1,600 pages, 1911) is the great storehouse of information. Rusk's *Introduction to Experimental Education* gives a large part of what is in Meumann's first edition, with additions of works in English. A student who has access to these four books can find his way to most of the other literature through their summaries and bibliographies.

The bibliographies in this book, though not complete even of English writings, still aim to give the important contributions. I have included only occasional references in German, French, and Italian, because they are usually inaccessible to beginners and would therefore add little to the practical value of the lists. A student wishing foreign articles and books can find them by going to the books above mentioned and to the bibliographies referred to in my lists. Articles in the *Pedagogical*

Seminary and the *Journal of Educational Psychology* usually have good bibliographies. The Clark University Library, under the direction of Dr. L. N. Wilson, has published since 1899 an annual bibliography of books and articles on child study (now issued as one of the bulletins of the Bureau of Education, Washington). For articles on physical growth and training, sports, athletics, and kindred subjects, the *American Physical Education Review* (Springfield, Mass.) publishes a quarterly bibliography of works in English. The current magazines referred to at the end of each chapter also often have good book notices and reviews.

In conclusion, it is a pleasure to add my name to the long list of those who acknowledge their indebtedness to Dr. Hall for numerous suggestions and constant inspiration.

AMY ELIZA TANNER.

Clark University,
January, 1915

THE INTRODUCTION

FOR a number of years after its appearance in 1904 this book was the best of its size on its general subject. Since then several other excellent manuals have appeared, and the literature, particularly in German, has greatly increased in volume, while the theoretical field and the domain of practical application have widened, so that besides the nearly one hundred additional pages, the work of reconstruction necessary to a new edition had to be radical and extended, and the references nearly trebled in number. Much of the matter has been worked over in the author's Saturday morning lectures at Clark University, and it has all been especially adapted to textbook purposes in colleges and normal schools, where it ought to have wide use. The last should always be the best, and I think *The Child* meets this requirement, excellent as are its competitors. At any rate, the copious reference addenda will be very helpful to teachers and experts as well as to students in this field.

So vast has the domain of child study, or paidology, now become; so central and all conditioning not only for school work but for all the score of agencies of child welfare; so important for the home, Sunday school, juvenile court, care of defective and dependent children; so vitally concerned with the method and matter of every school topic, as well as with every item of hygiene, eugenics, play, child labor, moral and religious training, and so on, that the work of selection and proper perspective, and the decision of what to omit, may well tax any

author's power of judgment, and that to the uttermost, at every step. But in scanning these pages I think the judicious expert will agree with me that this task has been well accomplished. Indeed, it is on the whole a book I should like to have written myself, and I can only congratulate the author on the successful accomplishment of a most perplexing and at the same time a most important task and bespeak for her work the large place that it so well deserves among all who are interested in childhood.

Genetic psychology has three divisions,—animals, primitive man, and children. Not only do these three stand in close and sympathetic relation with each other, children being particularly interested in animals and savages, but the scientific study of each sheds light on the others, childhood particularly being a new-found key to the stages of the development of mind in the world. The Freud-Adler literature has in recent years shed a new light upon all the early phases of child development and greatly magnified the importance of infancy, not only for all later steps in the unfoldment of the mature mind in general, but finding in apparently slight abnormalities in the silent and unremembered first quadrennium the germs of about every psychic and nervous disorder in adult life, including every form of arrest. Moreover, the unconscious, which is now looming up in a way that promises to make it a large part of the psychology of the future, is coming to be actually identified with childhood, Freud going so far as to declare in round terms, "Das Unbewusste ist das Kindliche."

Up to a few years ago it could be truthfully said that in this country we had lost touch with childhood and its nature and needs to a degree without parallel in all the world. Besides the nearly one million childless homes,

the relegation of parental duties to the school and church and other public agencies, the relative increase of delinquent, defective, and even dependent classes, and the dull mechanization of education and its methods and matter, the scantiness of toys, plays, and games and the rapid urbanization of our life have been very hard on children. Now a Copernican revolution from the scholiocentric to the paidocentric view of education has begun, and everything—topics, order, methods of teaching, and study—is becoming more and more plastic to the nature and needs of childhood, as the degree of adjustment to childhood is the standard by which not only progress in all pedagogic fields but the effectiveness of every human institution and of progress in general is best measured. If there is such a thing as a "call to teach" it consists in loving children, and with love go insight, the power to serve, and the desire to help each child to the maximum development of body and soul of which he is capable. When vocational guidance is fully developed those intending to teach will ask themselves the question, which is the supreme test of their fitness, "Do I really love children?" Those who do not have no right to teach. To incline those who read it to know children better, because this means to love them more insightfully and efficiently, has been, I believe, the author's chief purpose.

G. STANLEY HALL.

Clark University,
January, 1915

THE CHILD

HIS THINKING, FEELING, AND DOING

CHAPTER I

General Remarks

NATURALLY enough, children have always been objects of the greatest care and solicitude to society, and have always been observed and studied, as early educational theories show. Still, while some systematic observation has been done before, it has been left for our scientific age to attempt to reduce children, along with men, to the terms of a general formula.

Child study: its importance

The importance of ascertaining the laws that govern the growth of the child's body and mind is apparent to the most superficial observer. Until we know how a child grows; whether he is of the average height and weight or not; whether he has the average control of his body or not; whether he shows signs of nervousness or not, we can know nothing of what the correct treatment for that child is. We may hit accidentally upon it, but we are just as likely to leave the child to suffer from improper food or exercise or work. Similarly, until we know the general characteristics of each stage of mental development, we are unprepared to say what a child should study and how much he can do. We cannot settle any of the questions concerning the courses of study, the order of subjects and the mode of presenting a subject, except as we know the child nature which we expect to develop by our education.

But when we ask what this child nature is, we find ourselves face to face with the most important and most unsolved problems of biology and psychology. In the first place, we must keep in mind that the newborn baby comes into the world "trailing clouds," but whether of glory or of shame depends upon his ancestry. He is not a blank sheet of paper upon which we may write what we will, but from the beginning responds to stimuli in ways that are determined by his inheritance. It is supposed that direct inheritance from the parents has the most potent effect; from the grandparents one half as much as from the parents, the next generation back one half as much again, and so on back to the first ancestor. Biology cannot yet tell us definitely how this is brought about, nor how progress made by the parents can be transmitted to the children, though there is little doubt of either as a general truth. We must therefore first of all remember that in dealing with a baby we are to some extent dealing with psychic processes—instincts, feelings, and so on—that have their roots far back of human existence in animal life, and probably in some cases very primitive forms of animal life, as well as with processes that are distinctively human and individual.

Genetic standpoint

But again, when we thus assume that a child sums up or recapitulates the race experience, psychically and physically, we must understand what this means. The earlier ideas on these points were very crude. According to them, a human being in the course of embryonic development passes through all the great stages of animal life—such as an amœba stage, invertebrate stage, fish stage, monkey stage, and so on,—and is essentially like that genus at that stage. Psychically the same was assumed to be true,

Physical recapitulation

and at birth the child was supposed to have innate and inherited ideas which determined his reactions to objects. The truth is far more complex and can as yet be only tentatively stated. It is beyond question that in its development the human embryo shows traces of its very primitive ancestors. During the first month, for instance, there are gill slits in the neck which indicate a fish-like stage. There are also formed at an early stage amœba-like cells, and some of these persist in the blood. But this is very far from saying that the embryo is at this stage a fish, and so on. On the contrary, one of the most characteristic things about the human embryo is the very early stage at which the *Anlage*, or beginning of the brain and central nervous system, is laid down, and the great prominence which this has through the entire embryonic development. That is, the most characteristically human organs appear at very early stages in the embryo and also develop for the longest time. Some of the most primitive organs appear at very early stages but soon disappear; others appear at intermediate stages and may persist or disappear either before or after birth. No law has as yet been stated for this, but perhaps we may say in a very general way that organs which have proved themselves of great advantage to the species tend thus to appear earlier and earlier, and to grow for longer and longer times, while those which are either of no use or of little use also tend to appear earlier and earlier but atrophy sooner and sooner as well. While each individual, therefore, in his development both before and after birth, shows traces of all his ancestry, the traces do not appear in the same order in which animal life has developed from lowest to highest, and they are often very faint and fleeting. The record is like the geological record in a volcanic or earthquake region, in which strata are

crumpled and inverted, so that the geologist must know what the original arrangement was before he can identify the displaced and modified strata. So in ontogenetic or individual development, because we already know what the phyletic or race development has been in general from unicellular life to man, we can to some extent decipher the corresponding characteristics in man and see how his human career has both changed the order of growth and modified the organs and functions. As we learn more of man we realize more and more how the later stages of phyletic development preponderate in the development of each human individual.

The genetic psychologist must assume that what is true of bodily development is paralleled in psychic processes.

Psychical recapitulation

The crude notion that a baby is born with full-fledged innate ideas has long since been given up, but so has the equally crude opinion that his mind is like a sheet of unwritten paper, which will take any imprint that we choose to give it. Here, too, the truth is more complex by far and cannot yet be satisfactorily stated. The least that can be said is the following: Just as there is a continuous development of bodily organs and functions from the beginning of embryonic life up to the mature adult, so there is of psychical processes. The nature of these psychical processes is determined by the structure of the organism, and especially its nervous system, upon which depend the reception of and responses to stimuli. We must conceive of a continuous gradation of psychical processes from those so vague and faint that they never get out of the subconscious to those that are in the center of attention in the most highly developed adult. The battle is still being fought among the biologists as to whether organisms without a nervous system can be supposed to have any

form of consciousness, but all agree that there is at least some vague sentiency from the stage in which nervous ganglia are first found up to man. From then on the psychical processes are supposed to increase continuously in complexity and distinctness. In the individual development also, we certainly cannot question that some vague sensational or feeling processes must be present in embryonic life at least as early as when the *Anlage* of the brain and nervous system is laid down, but here, as in the physical development, the order is not the same in the individual as in the race. The later stages have profoundly modified the earlier, and so, while the psychical processes are homologous with certain processes in the phylum, they are by no means identical with or even very similar to them. That is, the psychical development is human from the beginning, just as the bodily is, though at the same time it is the human modifying the ever present and important animal factors.

Psychical inheritance

But how can psychical factors be inherited if there are no innate ideas? It can be only through the inheritance of certain organic structures which lead to definite reactions to certain kinds of stimuli and thus to certain psychical states. Perhaps the most universal instance is hunger, although it is also one of the most complex. The sensation of hunger depends upon the condition of the digestive tract as well as of the entire body, which sends stimuli to the central nervous system, giving as a result the sensation of hunger. Again, in little babies as well as in most adults, a loud noise calls out expressions of fear, and we infer thence to a fear state of consciousness; that is, psychical inheritance cannot be considered apart from physical inheritance. From similar bodily conditions we infer similar psychical

states, and so, if certain bodily structures and functions are inherited, we can say fairly that their allied psychical states are also inherited. But here we must also keep in mind that just as instinctive acts do not occur until the proper stimulus sets them off, so it is with their allied psychical states; and just as some instincts do not ripen for months or years after birth, so it is with the psychical states corresponding. So here, too, the order in which given psychical states appear proves nothing as to whether they are inherited or acquired.

Objective standpoint

A human being is therefore the most complex organism in the world. His body contains millions of cells and his nervous system billions more, all of them constantly changing in their relations to each other and to the world about him, especially in the growing years of childhood. Their inner, psychical aspect can be no less complex and subtle and shifting, though we have as yet no psychical microscope to reveal the infinitesimal changes in the psyche which correspond to the slighter and simpler physical and nervous changes. Within ourselves we can observe only the coarser changes, in conscious processes, and in children and lower animals only changes in behavior, and we infer from them the psychical states within. The thing most to be desired in child study is careful observation and description of children in this objective way, for if we know how they act under given conditions we shall know how to get what results we want and have thus a scientific and objective basis for education in all its aspects. From the point of view of applied psychology, that is, behavior is the significant thing, and the mental state assumes importance only as an interpretation of behavior and so as being of assistance in controlling otherwise inexplicable changes in behavior.

We already have a large body of facts about children, partly accurate and partly inaccurate. Systematic child study should supplement and correct these by careful observation and description and thus give a firm basis for the science of education.

Methods of child study

In this study, two methods are possible, each of which may be pursued in two different ways: (1) We may study some individual child with great care and detail, or (2) we may collect statistics from large numbers of children. In both cases we may get our material simply from observing children, or experiment upon them by fixing certain conditions under which they shall act.

(1) Individual study has the decided advantage of accuracy in details. We become intimately acquainted with some one child, and learn to see the various fine shadings of his mind. We discern the gradually increasing complexity of his mental processes. We can see the close connection between mind and body in many details, and trace to their origin numerous quaint ideas and marked characteristics. In this way we can learn to deal with this one child so that we shall make comparatively few mistakes, even though our theoretical knowledge be not very wide.

On the other hand, such a study fails us in many respects when we come to work with other children. We cannot be certain which of this child's traits are peculiar to him or his family and which are common to all children of his age, nor can we be sure just what importance to attach to certain traits. We cannot tell whether to ignore them because they will naturally be outgrown, or to repress them.

(2) Group study aims to give just this sort of information. It collects data from large numbers of children of

all ages, compares them, and finally is able to make a statement about certain characteristics of the great majority of children of each age. Such general statements, when based upon sufficient data, rest upon the same kind of foundation that the laws of any science do, and have the same authority.

It is evident that such group study is strong where individual study is weak and, vice versa, is weak where individual study is strong. It lacks the detail and vividness of the individual study, but is more generally true and is likely to be a safer guide when difficulties come up in treating the average child whom we have not had the opportunity to study. The two methods should, therefore, supplement each other. Each parent or teacher should get a perspective for himself by a knowledge of the general facts of child nature, and then fill in details by a study of the Mary and Johnnie with whom he lives.

This outline of child nature is what child study hopes to accomplish, but as yet the outline is fragmentary.

Results of child study

More observations have been made on the physical nature of the child than on anything else, but even here there is great divergence of opinion as to the meaning of the facts observed and as to their practical bearing. Good work has been done on small groups of children in observing most of the mental processes and some of the forms of expression. From this we may get hints for an educational theory, but it is valuable so far principally in giving suggestions for further observations.

If, therefore, few conclusions are reached in the study given here, it must be remembered that this is inevitable under present conditions. It is easy to form a theory if we have studied only a few children, but the more data

we gather from large numbers of children the more probable it seems that our present educational theories must be considerably enlarged and altered before they will be applicable to most children.

The object of this book is not, therefore, so much to offer conclusions, as to outline what has been done, to show breaks in the outline, and to point out places for future work.

CHAPTER II

Growth of the Body

ALL weighing should be done with the child nude, and all measuring without his shoes on.

1. Beginning with birth, keep a record of the changes in weight and height. For the first month, weigh and measure the baby every week; thence, to the end of the first year, every month; thence, every three or six months. There is very little material at present on changes between the first and the sixth year, and any parents who will keep such a record carefully will help to fill one of the gaps in the subject of child study.

Observations

2. If you do not undertake any systematic record, at least weigh and measure your children now and see how they compare with the average weight and height as shown in the tables.

3. In some schools it is possible for a teacher to get statistics as to the height and weight of each child in her room. Where she cannot do so, she can usually get the height and weight of children who are peculiar, to see how they compare with the average height and weight as shown in the tables.

4. In cases where children fall below the average, begin a little experimenting, if possible under a physician's advice, with their food and work. Keep a record of the changes you make in the food and the work, and of the effect upon the children.

As our knowledge of the mind increases we see more and more the close interrelation of mind and body, and we realize that in trying to understand the condition of either at any time, we must take into consideration the effect of each upon the other. We have no right to expect the

Importance of the subject

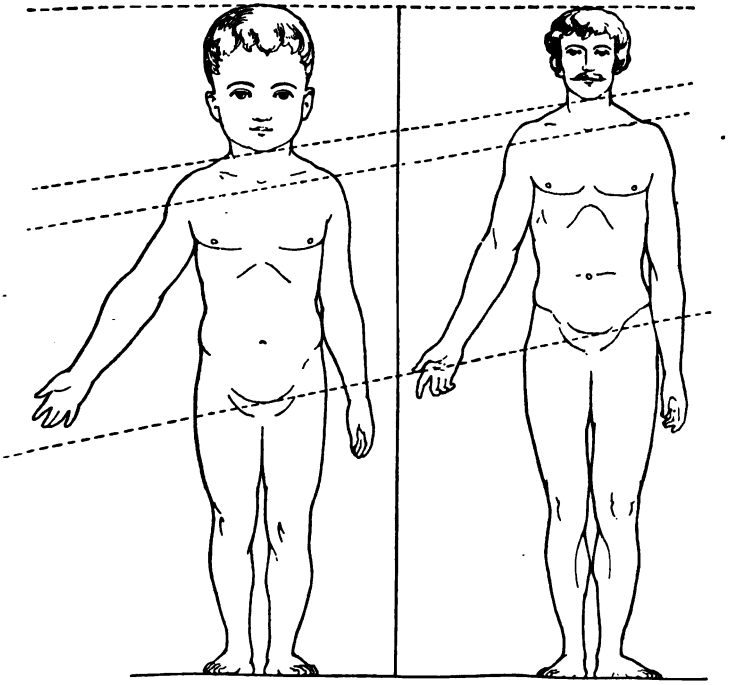


DIAGRAM 1. SHOWING THE RELATIVE PROPORTIONS OF THE BODY IN CHILD AND ADULT. (LANGER.)

same mental work or the same moral standards from a child who is sick, or cold, or hungry, as from the one who is healthy, well fed, and well clad. The parent whose child is much below the average in growth or in the

control of his muscles, should be warned thereby to be on the watch for various mental or moral abnormalities. As there is no way of watching a child's mind except as he reveals it through his movements, it becomes of great importance that we should understand at least a little of what his movements signify.

It is not uncommonly assumed that a child is simply a little man or woman. How untrue this is as to his body, a glance at Diagram 1 reveals. A child who grew to manhood preserving his childish proportions would be a monstrosity. What is so evidently true of the body as a whole applies equally to details. The internal organs, the bones, blood, fat, marrow, and nerves all differ so materially from the adult's that when similar chemical structures are found in him, they are considered pathological. We cannot, therefore, believe that a child can eat the same food, breathe the same air, wear the same clothing, and take the same exercise as an adult, and obtain the highest degree of health.

Child versus man

Considering first the increase in weight from birth to adolescence, observations upon hundreds of thousands of children show that at birth the average weight of a boy is 7.3 pounds; of a girl, 7.1 pounds. The boys' weights vary from 3 pounds to 12 pounds, but 87 per cent of them weigh between 6 and 9 pounds. The weights of the girls come within the limits of 4 and 11 pounds, with 85 per cent between 6 and 9 pounds. The limits of safety, then, for both boys and girls, seem to be 6 and 9 pounds.

Weight

One of the most interesting characteristics of growth, both in height and weight, is its rapidly diminishing rate after as well as before birth. During the first three months of embryonic life it is estimated that the weight

increases 400,000,000 per cent; during the second three, 5,182 per cent; during the last three, 252 per cent; while from birth to maturity the child will grow only about twenty-fold and during the first year after birth only about three-fold. By the end of the first year the average boy weighs 21.9 pounds and the average girl 21.3 pounds. Koplik gives the following average rates of growth during the first year: from the second week to the fourth month, one ounce a day; from the fourth to the sixth month, one half to two thirds of an ounce a day; from the sixth to the twelfth, one half an ounce a day. At six months the child should weigh about twice what he did at birth.

Lessening rate of growth

During the nursing period there is no one health index more important than that of increase in weight. If a baby begins to lose weight, or even remains stationary, no effort should be spared to find the cause and to remedy it.

In the registration area of the United States in 1910 the deaths of babies under one year constituted more than one sixth the total number of deaths— 140,057 out of 732,538. As the registration area is only 55 per cent of the total population, nearly twice this number of babies dies every year, and Irving Fisher estimates that 47 per cent of these deaths are from preventable causes. Thirty per cent, or nearly one third, are due to diarrheal diseases, and only 15 to 20 per cent to pneumonia and bronchitis.

Infant mortality

These digestive disturbances have various important causes. In breast-fed babies the mother's milk may not be sufficient in amount or may be lacking in food qualities, so that it needs to be supplemented by other food. In babies not breast-fed, the milk or food used may be indigestible for the baby; or

Causes

may be lacking in some of the necessary food qualities; or, still worse, it may be impure, so that the baby gets some bacterial disease. Numerous investigations show that breast-fed babies have a great advantage over those artificially fed. Their death rate is conservatively estimated to be only one fifth or one sixth as large as that of the artificially-fed babies; they are likely to weigh more, their general health is better, and their development is more likely to be normal.

Chemistry shows us why this is so. Milk is not just milk. Its composition varies greatly even from one breed of cows to another, and still more widely from animals to man. With a healthy mother, the milk is perfectly adapted to the needs of the child, and not only this but its composition changes during the months of the nursing period so that it supplies the different substances needed for growth at different ages. Any artificial substitute is almost inevitably lacking in some of these or else has them in excess, and the result is more or less defective nutrition or indigestion.

Accordingly, we find physicians stressing more and more the great importance of a mother nursing her child as far as possible. Every three months that a baby gets the proper food increase its chances of life and health tremendously, and every possible means should be used to increase and prolong the natural supply.

If artificial food is also needed, great care should be used both in selecting the food and in keeping it pure. In most cases a physician should be consulted, and the baby should be carefully watched and weighed in order to be sure that it is gaining the proper amount. Fortunately, in many of our cities now there are milk stations where poor mothers may obtain pure milk either at cost or free, and may also get the services of a physician and

nurse free. Such stations have done much to reduce the death toll of babies during the summer months and deserve town or city support.

We have very few records of increase in weight from one to six years. Hall states that during the second year the child should gain four or five pounds and by two and a half years weigh about one fifth the adult weight.

By the sixth year, the average boy weighs 45.2 pounds; the average girl, 43.4 pounds. Thence to the seventeenth year, the following table shows the weights in pounds, with ordinary indoor clothing.

Average weights

BURK'S TABLE SHOWING AVERAGE WEIGHT OF 68,000 AMERICAN CHILDREN IN BOSTON, ST. LOUIS, AND MILWAUKEE

AGE	BOYS			GIRLS		
	Average in lbs.	Annual increase	Per cent of increase	Average in lbs.	Annual increase	Per cent of increase
6½	45.2			43.4		
7½	49.5	4.3	9.5	47.7	4.3	9.9
8½	54.5	5.0	10.1	52.5	4.8	10.0
9½	59.6	5.1	9.3	57.4	4.9	9.3
10½	65.4	5.8	9.7	62.9	5.5	9.6
11½	70.7	5.3	8.1	69.5	6.6	10.5
12½	76.9	6.2	8.7	78.7	9.2	13.2
13½	84.8	7.9	10.3	88.7	10.0	12.7
14½	95.2	10.4	12.3	98.3	9.6	11.9
15½	107.4	12.2	12.8	106.7	8.4	8.5
16½	121.0	13.6	12.7	112.3	5.6	5.2

According to this table, for boys there is a fairly regular increase in weight up to ten and one half years; then a slightly retarded one to twelve and one half, and then the adolescent more rapid increase up to the end of the observed ages, sixteen and one half. The most rapid rate is put at fifteen and one half years by most observers. With girls the retardation period is very slight, and the adolescent acceleration runs from eleven and one half to fourteen and one half with the greatest height at twelve

and one half. In general girls weigh slightly less than boys of the same age, but from twelve and one half to fourteen and one half slightly more.

After the sixteenth year measurements on college students show a progressive diminution in the rate of growth, though there is some increase at least up to twenty-five years. College students, however, are a picked class, and probably their growth is greater, both absolutely and relatively, than that of the general population.

Height

The average newborn boy measures 19.68 inches, with the extreme limits at 15 and 24 inches; the newborn girl 19.48 inches, with the limits at 16 and 23 inches. The most rapid growth in height, as in weight, is in the first months of life. In the first month, a child adds something like 2½ inches to his length and by the end of the first year has increased from 7 to 8 inches. At the time of the first dentition Camerer observed a lessening of the rate of growth. At the age of six years, the average boy measures 44.10 inches, the average girl, 43.66 inches. Thence to the seventeenth year, their average heights in inches are shown in the following table.[1]

Years	6	7	8	9	10	11	12	13	14	15	16	17
Boys . .	44.10	46.21	48.16	50.09	52.21	54.01	55.78	58.17	61.08	62.96	65.58	66.29
Girls . .	43.66	45.94	48.07	49.61	51.78	53.79	57.16	58.75	60.32	61.39	61.72	61.99

[1]These measurements were taken without shoes. As only American children are included in them, the measures are slightly larger than the average. The American-born child is slightly taller and heavier than the English, Irish, German, or Scandinavian child. No comparative measurements exist for other nationalities. We should also note here that the periods of most rapid increase, both in height and in weight, are put from one to two years earlier by some writers. Doubtless food, nationality, and climate influence this. This table is taken from Bowditch.

There is probably a slight increase in height up to twenty-five years, but there have been relatively few measurements after the seventeenth year.

Here again we note a rhythm of much the same nature as that of the increase in weight. The boys, as a rule, are taller than the girls except between the ages of thirteen and fourteen. Their periods of growth are more sharply defined, and individuals differ from each other within wider limits. The differences between individuals also increase with age. It is sometimes said that up to adolescence a child lives the race life; at adolescence there is a strong development of family traits, and thereafter the child becomes more individual.

Rhythms of growth and other changes

The most marked fluctuations in growth occur between the years of six and nine for both boys and girls, and again between eleven and thirteen for girls, and fourteen and sixteen for boys. The first period is closely connected with the getting of the second teeth, and with the fact that at this time the brain is rapidly developing fibers of connection between its various parts. On account of this brain growth, there is usually a marked mental change in each child. He has more interests, he plays more kinds of games, and he has a wider range of friends than before. The second change is the accompaniment of puberty and will be considered later.

Relations between growth in height and in weight

It is most interesting to notice that, taking into consideration all the observations made, periods of rapid growth in height *precede* periods of rapid growth in weight, although this is not so marked with girls as with boys. This is true not only of the larger periods of which we have spoken, but of shorter periods as well.

R. Malling-Hansen of Copenhagen made observations upon one hundred and thirty boys from seven to fifteen years of age, for a period of two years, to find out what rhythms of growth occur within the cycle of the year. He found these well marked both in height and in weight. The period of most rapid growth in weight is from August to December; of average growth, from December to the end of April, and of least growth from April to August. Conversely, the greatest increase in height is from April to August, and the least from August to December.

Shorter rhythms of growth

Within each month he observed rhythmical alternations, a period of growth of perhaps fifteen days alternating with one of comparative rest. He also found a similar rhythm within the week, and noticed that during the day children increase in weight and decrease in height, while during the night the converse is true. Heat and light seem to accelerate increase in weight. Camerer corroborates Malling-Hansen in most of his observations; and Vierordt and Fleischmann also corroborate the weekly rhythms.

None of these observers has dealt with large numbers of children, and therefore we need further data before we can be sure that these rhythms are universal; but the various observers agree as far as they have gone, and there seems to be no good reason *a priori* why the facts should not be generally true.

When we consider the growth of the various organs of the body, and of the skeleton, muscles, and nervous system, the most striking fact is that it is irregular. At any given time, certain parts will be developing rapidly, and others slowly. The details of this growth are much too complex to be given here, and their meaning is not yet

Growth of different parts of the body

understood. It need only be stated that at adolescence the heart and lungs, as well as the reproductive organs, are growing very rapidly, and that between seven and nine the brain is developing numerous fibers of connection, although it is increasing little if any in size.

VIERORDT'S TABLE, SHOWING THE RELATIVE GROWTH OF VARIOUS PARTS OF THE BODY, COUNTING SIZE AT BIRTH AS 100.

	BIRTH	END OF 21 MOS.	7½ YRS.	ADULT
Length of head	100	150	191.7	200
Upper part of head	100	114	150	157
Length of face	100	200	250	260
From chin to upper end of breastbone	100	500	700	900
Breastbone	100	186	300	314
Abdomen	100	160	240	260
Leg	100	200	455	472
Height of foot	100	150	300	450
Upper arm	100	183	328	350
Forearm	100	182	322	350

Relation of size to food

It goes without saying that a child that is well fed will be taller and heavier than he would be if he went hungry, but there is another and erroneous idea connected with this. We often assume that any well-fed child will be taller and heavier than one poorly fed. This is not so. Size depends not only upon good nutrition but also upon nationality, climate, and family. There seems to be a certain size for each individual, which his body will strive desperately to reach even under the most unfavorable conditions, but which it is not likely to exceed under any circumstances. In this struggle, disease or insufficient food before the age of six has the most permanently bad effects. After that time, any drawbacks will retard growth temporarily, but will be followed by an unusually rapid growth. A child who has had good health up to the sixth year has an excellent start in life.

Bowditch's Tenth Report seems to show conclusively

that children of the poorer classes are lighter and shorter than those of the well-to-do, though the differences are small. All observers find that the professional classes are, at any given age, taller and heavier than the laboring classes. This is true in England, Germany, Denmark and Sweden.

The rate of growth, however, does not seem to be markedly different; that is, the poor child grows as rapidly as the rich, but is shorter and lighter to begin with. This seems to indicate that the embryonic and early conditions of nutrition are the most important for absolute weights and heights.

Exactly what importance should be assigned in growth to food, race, and climate is still unsettled. Americans are taller and heavier than other nationalities, but this is not due exclusively to race, for an Irish-American or German-American recruit is taller and heavier than his brother in the old country. Food and climate evidently have considerable influence here.

Relation of size to mental ability

It is significant that idiots and imbeciles are usually shorter and lighter than normal persons; but on the other hand, we must not forget that men of talent, if not of genius, are not infrequently small. We cannot maintain that men below a given height and weight are stupid, any more than we can hold that size has no relation whatever to mental ability. The case should probably be stated thus: Any child who falls much below the size of other members of his family at the same age, is also likely to fall below them in intelligence. A more direct relation between mind and body is given in bodily control, which we shall consider later.

In view of the well-marked rhythms of growth, the question at once arises as to their bearing upon education.

Should the child, while growing rapidly, have more or less school work? Should we stimulate him or quiet him? The most diverse answers have been given to these questions. The chief conflict has raged about the proper treatment of the adolescent boy and girl. We find some physicians declaring that girls from twelve to fourteen years old should be taken out of school entirely, and boys from fourteen to sixteen years old given much less mental work to do. Many educators, on the other hand, claim that this is the time when permanent interests in all subjects must be established. The child now lives in a new world—one of ideals—and we must introduce him as speedily as may be to the best in literature, history, science, art, music, religion, and everything that goes to make up our complex life.

Periods of growth and education

We may perhaps untangle a few of the threads from this knotted skein by comparing the periods of greatest susceptibility to disease with those of adolescence. Dr. E. M. Hartwell of Boston has made tables based on the mortality returns of Boston for 1875, 1885, and 1890. He finds that specific life-intensity, that is, ability to resist disease, varies as follows:

Relation of age to disease

Age	Per cent of increase in weight		Specific life intensity		Per cent of increase in height	
	Girls	Boys	Girls	Boys	Girls	Boys
5–6	4.00	5.20	60.08	67.3	8.88	10.24
6–7	4.08	4.58	69.5	74.5	9.69	8.78
7–8	4.58	4.38	103.8	106.8	8.83	9.86
8–9	3.72	4.03	123.2	164.0	10.68	9.79
9–10	3.98	4.04	195.4	134.8	9.26	10.40
10–11	4.06	3.12	191.2	209.3	10.24	7.43
11–12	4.56	3.39	309.0	233.2	13.78	9.74
12–13	4.08	3.78	232.0	290.1	13.23	10.31
13–14	3.11	4.68	162.0	238.7	10.94	11.66
14–15	1.90	4.01	171.3	250.1	7.83	13.02
15–16	.77	4.36	169.3	188.1	5.61	12.96

According to this table, girls from eleven to twelve years old and boys from twelve to thirteen years old are better able to resist disease than at any previous time, although the increase in power of resistance is not so marked with boys as with girls. The entire period from nine to thirteen for girls and from ten to fifteen for boys is the time of greatest resistance to disease, while the period after thirteen for girls and fifteen for boys is one of less power of resistance than the years immediately preceding. To state it in other terms, the period immediately preceding adolescence is the healthiest time of life; while adolescence itself falls short of this period but exceeds the period before the ninth year.

Other statistics, on the other hand, seem to indicate that the maximum resistance to disease comes somewhat later, when the boy or girl has practically finished growing in height and is making great gains in weight. This would seem to argue that the adolescent can endure a reasonable amount of work without harm. We need, however, more statistics which shall correlate all the factors of growth in the same children over a period of years before we can safely draw conclusions.

Throughout this account we have given only averages, and have constantly used such terms as "between certain ages" or "at about this age," in order to indicate that while the order of growth is the same in all children, any particular child may be more or less advanced than the average child of that age. C. W. Crampton has made this difference between what he calls the physiological and the chronological age the subject of especial study. We know, for instance, that the age for attainment of puberty may vary by as much as five years, and in very exceptional cases even more, so that some boys and girls of twelve are in various

Physiological age

respects as old as others of fourteen and sixteen. To put such precocious children with those of the same chronological age in their play interests is, Crampton believes, a great mistake and works harm both to the normal and the precocious children. Similarly, to force a slowly developing boy or girl to keep up with those who have developed more rapidly may do permanent and serious injury. The true standard, therefore, is not the number of years since birth, but the degree of development already attained, and while there are means and averages for the maturity of each part of the body, those responsible for a given child should know also in what respects he deviates from the mean, and should vary his training accordingly.

Conclusion

In conclusion: In the newborn child all the elements of the future man are present in germ, but education decides which factors are to grow and which are to atrophy. In the first years of life growth of all parts of the body is far more rapid than at any other time, and educational, that is, environmental, influences are most potent. There are at least two well-marked periods of growth in height and in weight with both boys and girls, of which the first is connected with the second dentition and the second with the setting in of puberty. Increase in height precedes increase in weight, and increase in weight is accompanied by increased resistance to disease, and is probably the time when mental work can be done to the best advantage. Size and mental ability have, not a direct, but an indirect, relation to each other, varying with the family, climate, and food. Any given child must be studied not only in comparison with other children of the same age, but also in comparison especially with others of his own family. We need not only general laws for all children,

but also for children of this or that family, just as we have laws for species of flowers in addition to those for the genera.

REFERENCES

Allen, Mary E. Physical Development of Women and Children. *Proc. Assn. of Phys. Ed.*, 1890, 9-21.

Bailey, J. *How to Teach Babies.* Hughes, London. $0.60.

Baldwin, B. T., *Physical Growth and School Progress*, U. S. Bur. Ed., 1914, No. 10, 188 pp. Bib. of 336 titles.

Boas, F. On Porter's Investigations. *Science*, Nov. 1., 1895.

On Growth of First-born Children. *Science*, N. S., Vol. I, 402-404.

Form of Head as Influenced by Growth. *Science*, N. S., Vol. IV, 50-51.

Growth of Toronto Children. *Rept. of Com. of Ed.*, 1896-7, 1541-1599.

Anthropological Investigations in Schools—Their Importance. *Science*, 1891, 225-228.

Growth of Children. *Science*, N. S., Vol. V, 570-573.

Boas and Wissler, Statistics of Growth. *Wash. Gov. Print.*, 1905, 132 pp. *Boston Am. Sta. Assn. Papers on Anthropom.*, 1894, 116 pp.

Bowditch, H. P. Growth with Reference to Disease. *Trans. Am. Med. Assn.*, Vol. XXXII, 376.

Growth studied by Galton's Percentile Grades. *22d Rept. Mass. Board of Health.* (Rearrangement of previous material.)

Growth of Children. *Eighth An. Rept. of Mass. State Board of Health.* Also *Tenth An. Rept. of Mass. State Board of Health.* (Supplements eighth with reference to effect of race and mode of life.)

Boyer, H. G. Influence of Exercise on Growth. *Am. Phys. Educ. Rev.*, Sept. and Dec. 1896.

Normal Growth and Development under Systematized Exercise. *Rept. of Chief of Bureau of Medicine and Surgery to Sec'y of Navy*, 1893, 141-160.

Bryan, E. B. Nascent Stages and Their Significance. *Ped. Sem.*, 1900, 357-396. (Detailed work for different ages.)

Bryan, W. L. Development of Voluntary Motor Ability. *Am. Jour. Psy.*, Nov. 1892, 125-204.

Burk, Frederick. Growth of Children in Height and Weight. *Am. Jour. Psy.*, Vol. IX, 253-326. Bibliog.

From Fundamental to Accessory in Development of Nervous System of Movement. *Ped. Sem.*, Vol. VI, 5-64. (Excellent articles. Summarizes much previous work.)

Burnham, W. H. Hygiene of Schools. *Ped. Sem.*, 1892, 9-71. (Very complete to date.)

Camerer, W. Untersuchungen über Massenwachsthum und Langenwachsthum. *J. für Kinderheitskunde*, Bd. 336, 249-293. (Most important contribution on infantile growth, up to 1898.)

Carven, A. Pain and Strength Measurements of 1507 School Children. *Am. Jour. Psy.*, 1899, 392-398.

Chamberlain, A. F. Recent Anthropometric Studies. *Ped. Sem.*, Vol. VIII, 239-257.

Crampton, C. W. Physiological Age. *Psy. Clinic*, 1907, 115-120; *Ped. Sem.*, 1908, 230-237; *Jour. of Ed.*, 1912, 462-3; *School Hygiene*, 1910, 81-83.

Cronin, J. J. Physical Defects of School Children. *N. Y. Inst. of Somat. Rept.*, Dec. 1907, 9 pp.

Cushing, F. H. Manual Concepts: Study of the Influence of Hand Usage upon Culture Growth. *Am. Jour. Anthrop.*, Vol. V, 289-317.

Dawson, G. E. Children's Interest in the Bible. *Ped. Sem.*, Vol. V, 43. (Summary of facts of growth.)

Donaldson, H. H. *Growth of the Brain.* Scribner's, N. Y. $1.50.

Du Bois, Raymond. Physiology of Exercise. *Pop. Sc. Mo.*, Vol. XXI, 317-331, 333-433.

Foster, W. L. Physiological Age. *Psy. Clinic*, 1910, 83-88.

Galton, Francis. Growth. *Rept. of Anthropometric Com. of British Assn.*, 1883.

Height and Weight of Boys of 14 Years. *Jour. of Anthrop. Inst. of G. B. and Ireland*, Vol. V, 173-180.

Hereditary Stature. *Jour. of Anthrop. Inst. of G. B. and Ireland*, Vol. V, 488-499. Summary of these in *Rept. Com. of Educ.*, 1895-1896, 1175-1198.

Hereditary Genius. Macmillan, London. $2.50.

Natural Inheritance. Macmillan, London. $2.00.

Principles and Methods of Assigning Marks for Bodily Efficiency. *Nature*, Oct. 3, 1889.

Gilbert, J. A. Researches on School Children and College Students. *U. of Iowa Studies in Psy.*, Vol. I, 1-39.

Greenwood, J. M. Height and Weight of Children. *Rept. of Supt. of Ed. of Kansas City*, 1890-91, 45-56.

Hall, G. S. Adolescence, Vol. I. Appleton, 1904. Chapters on Growth.

Hall, W. S. First 500 days of a Child's Life. *C. S. M.*, Vol. II, 1897.

Changes in Proportions of Body in Growth. *Jour. of Anthrop. Inst. of G. B. and Ire.*, Vol. XXV, 21-46.

Halleck, Reuben Post. Education of the Motor Centers. *Trans. Ill. S. C. S.*, Vol. III, 46.

Education of the Central Nervous System. Macmillan, N. Y. $1.00.

Hancock, J. A. Preliminary Study of Motor Ability. *Ped. Sem.*, 1894, 9-29.

Hastings, W. W. *Manual for Physical Measurements.* Springfield, Mass., 1903, 112 pp.

Hawkins, C. Physical Measurements of Public School Boys. *Jour. of Ed.*, 1891, 35-41, 187-190.

Hrdlicka, A. *Anthropological Investigations on 1,000 Children, White and Colored.* Wynkoop, Hallenbeck, Crawford Co., N. Y.

Kerr, James. Physiological Variations in Children. *Child Study*, 1909, 65-82.

Kirkpatrick, E. A. Development of Voluntary Movement. *Psy. Rev.*, 1899. 6 pp. (Nativistic theory of perception.)

Physical Fitness and Unfitness of School Children. *Proc. N. E. A.* 1905, 760-766.

Krohn, Wm. Habitual Postures of Children. *C. S. M.*, Vol. I, 114.

Lander, B. J. Posture and Its Indications. *Pop. Sc. Mo.*, Vol. XLII, 26-34. (Describes some common characteristic postures of disease.)

Lindlay, E. H. Some Motor Phenomena of Mental Effort. *Am. Jour. Psy.*, July 1896, 491-517.

Mackenzie, R. T. Place of Physical Training in a School System. *Montreal Med. Jour.*, 1900, 30-36.

MacNamara, N. C. Human Brain in Relation to Education. *West. Rev.*, 1900, 634-640.

Mosher, Eliza M. Habitual Postures of Children. *Educ. Rev.*, Vol. IV, 10 pp.

Oppenheim, N. *Development of the Child.* Macmillan, N. Y. $1.25.

Pearson, K. Intelligence. . . Size and Shape of Head. *Biometrika,* 1906, 105-146.

Pohlmann, A. Upright Position. *Monist,* 1907, 570-582.

Porter, W. S. Physical Basis of Precocity and Dullness. *Trans. Am. Acad. Sc. at St. Louis,* Vol. VI, 161-181. Also *Am. Phys. Ed. Rev.,* Vol. II, 155-173, same article.

Growth of St. Louis Children, 263-380.

Posse, Nils. *Special Kinesiology of Educational Gymnastics.* Lee, Boston. $3.00.

Radosavljevich, P. R., Prof. Boas's New Theory of Form of Head. *Am. Anthrop.* 1911, 394-436.

Roberts, C. *Manual of Anthropometry.* Churchill, London. $1.50.

Rowe, S. H. *Physical Nature of the Child and How to Study It.* Macmillan, N. Y. $1.00. 211 pp.

Scripture, E. W. Education of Muscular Control and Power. *Studies from Yale Psy. Lab.,* II.

Seguin, E. Prenatal and Infantile Culture. *Pop. Sc. Mo.,* Vol. X, 38-43.

Shaw, E. R. Observations on Teaching Children to Write. *C. S. M.,* Vol. I, 226.

Smedley, F. W. *Report on Child-Study Investigation.* Chicago Board of Education.

Telford-Smith, T. Scientific Study of Mental and Physical Conditions of Childhood. *Pediatrics,* 1897, 317-321.

Thorndike, E. L. Empirical Studies on Theory of Measurement, N. Y., 1907, 45 pp. *Col. Univ. Cont.* XV, No. 3.

Theory of Mental and Social Measurements, 1904, 212 pp.

Tucker, M. A. Involuntary Movements. *Am. Jour. Psy.,* Vol. VIII, 394.

Warner, Francis. Physical and Mental Condition Among Fifty Thousand Children. *Jour. Roy. Stat. Soc.,* 1896, 125-128. (The basis of most other work of this sort.) *Sum. in Rept. Com. of Ed.,* 1895-6, 1175.

Study of Children and Nervous System of the Child. Macmillan, N. Y. Each, $1.00. (Both works cover much the same ground; very diffuse.)

Wissler, Clark. Correlation of Mental and Physical Tests. *Psy. Rev.,* Monog. Sup., Vol. III, No. 6.

Growth of Boys. *Am. Anthrop.,* N. S., 1903, 81-88.

CHAPTER III

Common Diseases and Defects

SINCE the connection between the sound mind and the sound body is as close as the last chapters have shown, it is of great importance for all who have charge of children to know some of the more common symptoms of disease. Examinations, made in recent years, of the eyes and ears of school children show that to a most appalling degree parents and teachers have considered children stupid, obstinate, and bad who are only partially deaf or blind. In the minds of physicians there can be little doubt that many other cases of supposed innate wickedness or laziness are in reality cases of some form of nervous derangement.

Prevention of disease

What we shall do, therefore, in this chapter is to describe some of the symptoms which should put parents on their guard and set them to watching the child in question more carefully, with a view to consulting with a physician should the doubtful symptoms persist. It should be well understood that such observations as the parent and teacher can make are only preliminary to the physician's examination, and that it is unsafe for a tyro to adopt on his own responsibility any course of treatment. The object is not to get rid of the physician, but to save children from the suffering due to the neglect of unhealthy conditions which arise from our inability to know when they exist. We wish to sharpen our eyes to see wrong conditions so that they may be more speedily relieved. It is unquestionable that a very large percentage

both of deaths and attacks of disease could be prevented, and Irving Fisher goes so far as to say that 67 per cent of the children who die between the second and eighth years could be saved. In most cases we know both the cause and the remedy for the disease, but usually we do not discover the disease until it has obtained too much headway, and the resisting powers of the child are exhausted. It is of the utmost importance, therefore, that parents and teachers should know the danger signals, especially of acute and serious disease, so that the child may be promptly put into the hands of a competent physician.

Gastro-intestinal disease

We have already noted that in the first year of life gastro-intestinal diseases cause nearly one third of the mortality, and can be largely prevented by care in the choice and preparation of the baby's milk. If, however, there is an acute attack, it often begins with nausea and vomiting, usually with diarrhea and fever, and often with acute pain in the abdomen. Until a doctor can be obtained the safest treatment is to stop giving food and to give a cathartic, while a warm bath will often aid in relieving the pain and stimulating the nervous system.

Certain chronic diseases like rachitis and scorbutus are due to defective feeding, and while they may become very serious if neglected, they are easily cured by getting the proper food.

Bronchial diseases

Another disease that is especially serious during the first year of life is broncho-pneumonia. It usually attacks those of low vitality and its symptoms are doubtful. Usually there is at first a slight bronchitis, followed after a few days by sudden chill and fever, with perhaps vomiting and coughing. Other diseases of the respiratory tract are very

common, especially before the tenth year, and tuberculosis is more common among children than was formerly supposed. The best preventives of all such diseases are good food and fresh air.

Acute infectious diseases assume a special significance at the kindergarten age and thereafter on account of the ease with which they may be spread. We will therefore take them up in more detail, but must preface this account by certain general statements.

Variations in symptoms of disease

In the first place, the early symptoms of a disease may be somewhat differently described by different authorities, and an epidemic of a given disease in a certain year may have a characteristic severity or lightness. The causes of such variations are obscure, but must depend somewhat upon the differences in the strength and constitution of individual children, and in part upon climatic and other environmental conditions. Again, various diseases resemble each other in their early stages, showing certain common symptoms, and are sometimes hard to distinguish even by physicians. Teachers and parents should not therefore expect rigidly accurate descriptions, nor try to make a diagnosis for a specific disease. The important thing is that a child showing symptoms which may develop into an infectious disease or a serious attack of sickness shall not be neglected, but shall be carefully watched and promptly separated from other children if the symptoms seem to point to an infectious disease.

It must also be said that statements as to the period of incubation and of infection of infectious diseases vary considerably, as will be indicated below. This introduces uncertainty into the methods of preventing an epidemic, so that we find much variation. But since the control of this matter is not in the hands either of teachers or

parents, but of local boards of health, it falls somewhat outside our discussion. The statements as to mortality rates and age of greatest mortality and morbidity vary somewhat also in different countries and different sections of one country.

The least dangerous of the acute infectious diseases are German measles, chicken pox, and mumps. German measles usually seem to appear suddenly, with rash breaking out, a little sore throat and fever, and perhaps inflamed eyes. Both the illness and its after effects are usually slight. The disease is spread by the discharges from nose and mouth.

German measles, chicken pox, mumps

Chicken pox usually has little or no fever and only a slight rash, appearing as small pimples which fill with a clear liquid and gradually dry up. Mumps also seem to begin suddenly, with vomiting, fever, and pain about the angle of the jaw. The glands become swollen and very tender. The disease rarely leaves serious effects, but is quite infectious, probably through discharges from nose and mouth.

Whooping cough is much more serious. Koplik gives the mortality rate from it as 25 per cent during the first year; 5 per cent from the first to the fifth, and but 1 per cent between the fifth and tenth years. It rarely occurs after ten years, and is most frequent in the first year. The period of incubation is variously stated as from two to fourteen days. It usually begins like a cold in the head, with sore throat, and is worse at night. Instead of improving in a few days, it gets worse, the whoop appears, and the spasm of coughing may end in vomiting. The discharges carry the infection.

Whooping cough

Measles rarely occur in the first year, and are most

common between the first and fifth years. The period of incubation, from the time of exposure to the appearance of symptoms, is from ten to fifteen days.

Measles

At first there may be only slight lassitude and headache, and a little pinkness of the eyes, but very little or no fever. If the mouth is examined at this time, the soft and hard palates and cheeks may show irregular rose-colored streaks or spots, some of them with whitish centers. Two or three days later nasal catarrh, conjunctivitis and a cough appear, with a little fever, and the eruption soon appears, beginning usually on the face and head. It is supposed that measles are most infectious during the catarrh and eruption, but may also be given during the desquamation. The average mortality rate from them is about 8 per cent, largest in the first year of life, and less after the fifth year.

Scarlet fever is highly infectious and dangerous. Some authorities state that of persons below twenty years of age exposed to this disease, 56 per cent take it. It may be carried in clothing, on hands, from the skin, secretions, or excretions of the patient, and it is known that the germs live a long time folded in clothing and hidden in rooms. The infection may be given during incubation, eruption, and desquamation, that is, through the whole period of the disease. The period of incubation is not definitely known. Some German authorities state it as eight to ten days, some English as three to six. There are occasional cases of thirty days. The symptoms are also variable. There may at first be a a slight sore throat, especially if the child has a sensitive throat. A sudden rise of temperature may follow and then an attack of vomiting. From twelve to thirty six hours later the rash usually appears, first on the upper chest.

Scarlet fever

Diphtheria is also highly dangerous and infectious. It is most common between the ages of two and six, and is carried by discharges, on the hands, or by the clothing. The period of incubation is from two to eight days, but the average is three. The usual symptoms are sore throat, lassitude, pains in the joints, back, and head, but there may be very little fever. The throat usually shows the characteristic white patches, but in some cases these do not appear, and yet such cases are as infectious as any others.

Diphtheria

Influenza is highly contagious and the after effects may be serious, but it is rarely fatal. It is most frequent in children before the fifth year, and is spread in the discharges from nose and throat. The period of incubation varies from twelve hours to three days. The first symptoms are usually a chill, which may be followed by vomiting, then some fever and pain in the head and limbs. Usually there is a cold in the head and cough, the eyes, throat, and tonsils are inflamed, and the face is flushed.

Influenza

The eyes are subject to certain contagions which may lead to blindness or at least to pain in the use of the eyes. If there be discharges from the eyes, whether thin or thick, noticeable inflammation of eyeballs or eyelids, and sensitiveness to light, a child should be at once examined by a physician. Eye diseases in school are easily spread by the common towel, borrowed handkerchiefs, and in similar ways.

Infectious eye, ear, and skin diseases

Certain skin diseases, such as itch, are similarly spread, and any child who scratches himself persistently should be examined carefully. Itch, not to mention lice, cannot always be detected unless there is a careful examination.

Discharge from the nose, especially if it is thick and creamy, breathing through the mouth, enlarged tonsils or neck glands, should all be referred to the physician for examination. Breathing through the mouth, if habitual, is a common symptom of adenoid growths. These are most frequent between the ages of six and ten years, and are found in many children, some investigators putting the per cent as high as 25. The obstruction to breathing and the diminution in the oxygen obtained leads to lassitude and general mental slowness, so that the child is greatly hampered. The removal is a very simple process and usually entirely effective.

Adenoids

Defective teeth have also assumed great importance of late. We are just beginning to realize that with proper care a man's teeth will last his entire lifetime, —assuming that his general health and especially his digestion are good. On the other hand, dental examinations of school children show that from two thirds to four fifths of them have one or more decaying teeth, and school records show that a considerable per cent stay out of school several days a year on account of toothache. Parents very commonly do not care for the first teeth of their children, believing that as they soon drop out it does no harm to let them decay. Quite the contrary is true, however, for quite apart from the child's suffering from toothache, if the first teeth are imperfect and the gums unhealthy, or if the first teeth are pulled before the second are ready to come through, the second set is likely to be defective or misplaced.

Teeth

Again, during the second dentition especial care should be taken to see that the first teeth do not prevent the second from coming in evenly. During this period the difficulty that the child has in chewing his food properly

is likely to lead to imperfect digestion and may interfere with his school work. Pronunciation is also affected, and this may react to his discredit in reading and reciting. The preventive measures—which are being widely incorporated in school hygiene—are to teach the children the importance of brushing the teeth regularly and thoroughly, and to show them how to do it, as well as to emphasize the importance of prompt care of a decaying tooth.

General sanitation

We can only refer here to the numerous problems connected with sanitary schoolrooms and houses, such as the choice of a site, architecture, size and lighting of rooms, best methods of cleaning, colors for walls and ceiling, sanitary blackboards and erasers, fire escapes, plumbing and closets, and so on. These are discussed in detail in the standard texts on school sanitation and hygiene, to which references are given at the end of the chapter.

Again, we cannot discuss the problems connected with the physical care and the feeding of children, which are fundamental to health and morality, but must be content to refer to some of the standard texts.

Medical inspection and school nurses

Medical inspection in schools also can only be referred to here. The value of medical examination for all children has been abundantly demonstrated by what it has accomplished, although in many places the physicians are poorly paid and they handle such large numbers of children that they cannot give a thorough examination. The recommendations of the physician can, however, be made far more effective if there is some one connected with the school who follows up the children to see that the parents remedy the indicated defects as far as possible. In most cases this person should be a nurse who goes to

the child's home and talks with the mother, explaining the physician's directions and ascertaining whether or not the parents can pay for glasses, dental service, or whatever it may be.

The principal objection made to school doctors and nurses is on the score of expense, but from a broad viewpoint they save money to the community, both in preventing disease and increasing effectiveness, and in keeping each child in school more regularly so that the school plant is more fully used.

There are, however, some conditions over which the teachers can usually exercise some control, which are also very closely and fundamentally connected with the amount and quality of the mental work done by the children, and which soon react upon their nervous condition.

1. Bad air

The first of these is bad air, both at home and at school. Why is it that the American, even the well-educated American, is so insensitive to the need of pure air? Is it because he breathes badly and has his sense of smell dulled by catarrh? There must be some other explanation than that of ignorance, for the air even of most homes is not pure, and it is rare indeed to go into a schoolroom where the air is not impure. Many a sensible, well-educated man and woman goes to bed night after night with closed doors and windows, and many a housekeeper, exemplary in other respects, never feels the need of throwing the house open to the air and sun.

The simplest test for pure air is that the air in a room shall smell fresh upon coming in from outdoors. Even in winter time this is easy to secure. Have boards about four inches wide fitted into the bottom of the window casings, and let the windows rest on them instead of

closing down. This secures a current of air at the top, between the two sashes, and ventilates an ordinary living or sleeping room. There is usually no reason why a window should not be open in a bedroom at night, even in the coldest weather; but if that demands too much courage, at least the door can be open and a window in some other part of the house opened to lead to a circulation of the air.

In the schoolroom there is usually an inadequate system of ventilation. Architects do not consider, in their estimate of the necessary supply of air, the amount that is befouled by the bodies and clothes of the pupils. They consider only the nice, clean, healthy child, who is, in the city at any rate, the exception. As a result, the air in most schools is heavy from the first half hour after school opens to the end of the day. Then the janitor locks in the bad air to be used again the next morning.

Supplement this defective ventilation by opening windows at every recess and noon, and see to it that the room is thoroughly aired at night. If the room is made too cold for the pupils by this constant airing, warm them by some vigorous gymnastics, and particularly by breathing exercises. The fresh, invigorating oxygen will soon reconcile them to the slightly lowered temperature.

The great importance of the air supply lies in the fact that air that has once been breathed is deficient in oxygen, which is one of the most important constituents in building up nervous and muscular tissue. A person who breathes impure air five or six hours a day soon feels dull all the time. He cannot think clearly or rapidly because the brain centers are not properly fed, and his stupidity may become permanent. His resistance to disease is lessened, and he is subject to headaches and numerous minor evils.

The unsuspected value of fresh air has been demonstrated in the most striking fashion within the last ten years in the open-air and open-window schools. Perhaps the best example of this is the open-air school at Charlottenburg, a suburb of Berlin, Germany. Here sickly children spend the day, from eight to six o'clock out of doors, with food and baths supplied, and with only about half the usual number of hours spent in formal school work. Nevertheless they do in this time the full amount done by children in the regular school routine. Similar results have been obtained in other schools, even when little or no food is given the children and the sole difference is in the amount of fresh air obtained.

Open-air schools

The arrangements to protect children from unseasonable weather and from cold vary widely. In some instances the school is on the roof, a part of which is provided with a tent or a pavilion where the desks and school apparatus can be put. For cold weather, bags are provided for the children to use when sitting. In other cases an old building is modified by either taking out one outside wall of each room entirely, or by putting in a wide surface of windows which may be closed in bad weather. It is claimed that in such rooms, with a proper arrangement of the program, children will be comfortable at a temperature of about 45° F. and will be almost entirely free from the nose and throat troubles which afflict other children in closed rooms in the same building.

The most important thing to secure comfort is that vigorous physical exercise shall alternate with work at the desks, and the statement is made that as a rule after twenty minutes of play or exercise a child can sit comfortably for forty minutes, and do the work usually done in an hour.

Whether or not individual parents or teachers are inclined to try the open-air living and sleeping the year round, they can at least practice and teach deep breathing and the proper use of the lungs, and gradually accustom the children and the community to lower temperatures and better air in our dwellings.

Humidity

The humidity in the air has of late been receiving much attention on account of its relation both to temperature and to throat and nose affections. The normal humidity is between 50 and 60 per cent of saturation. If it be much greater it becomes very oppressive, while if much less, the skin and membranes of the nose and mouth which are exposed to the air become too dry, and the person takes cold more easily and is more likely to be nervous. One of the great advantages of the open-air schools is that the normal humidity is secured. As soon as windows are shut and artificial heating is introduced it becomes difficult to secure enough humidity. When air is heated it is also dried, and so rather often the humidity of our dwellings and schools goes as low as 30 per cent, and in cold weather, when all the windows are shut tight and the boilers are working at their limits, even as low as 10 or 15 per cent. Now, as the humidity diminishes, more heat is needed, and so we get the conditions so common of persons demanding a temperature of 75° F. or even more in order to be comfortable.

The obvious way to remedy this, and perhaps also the best, is that already suggested of opening all the windows wide for ten or fifteen minutes every two or three hours. In temperate latitudes outdoor air usually has sufficient humidity. If the teacher is so unfortunate as to be in a large building with an elaborate system of artificial ventilation, under which she is forbidden to open windows,

she can do little. The dish of water sometimes put on the heater evaporates so little that it is of little use. Some of the most recent ventilating systems also humidify the air introduced, but many do not.

The standards generally agreed upon for the air in a dwelling room are, as already said, from 50 to 60 per cent of humidity and a temperature of 65° to 70° F., with the preference for the lower temperature. The standard for purity or even what impurity it is that is injurious is just now the subject of much discussion. The rough and ready tests already referred to, of whether the air is offensive to a person coming in from outdoors, and whether those staying in the room become sleepy and tired, in the absence of the knowledge and apparatus necessary for testing purity, can be relied on under ordinary conditions. But instead of the ordinary thermometer, a wet- and dry-bulb thermometer should be put into every schoolroom so that the teacher can know the humidity as well as the temperature.

Habitual postures are now recognized as the cause of much fatigue and even of actual disease, particularly of various forms of curvature of the spine. Twenty to thirty per cent of high-school children have curvatures of the spine as the result of improperly made seats.

2. Bad seats

The most healthy posture in standing and sitting is, presumably, the symmetrical one, in which both halves of the body have the same position, because then the muscles on the two sides will be used alike, and all strain will be equally distributed. Variations from such a position should be compensated by the two sides alternating in the unsymmetrical position.

The best position in lying is still a matter of dispute. Some maintain that the symmetrical position here also

is the best, the person lying either on back or abdomen. Others claim that lying on the back keeps the spinal cord unduly heated and irritable, while lying on the abdomen compresses both stomach and lungs. They therefore advocate a position on either the right or left side. The truth of the case probably is that the best position for each individual will depend somewhat upon his bodily characteristics. There can be no question, however, but that lying on the back or abdomen allows the most complete muscular relaxation, and it seems doubtful whether there is any real harm done to spinal cord, or stomach, or lungs, provided they were in good condition at the start.

Practically all physicians agree that in order to be both comfortably and correctly seated, there must be certain relations between the size and shape of the seat and the person. The height of the seat should be the same as the length of the leg, measured from the under side of the knee bent at right angles, to the sole; the depth from front to back of the seat should be only enough so that the entire back can rest against it, and the seat-back should follow the curves of the spine. If the seat is too high, there is constant strain in the attempt to keep the feet on the floor, and a strong tendency to slip forward in the chair and sit on the end of the spine. This alone may lead to tenderness of the spinal cord and consequent nervousness. If the seat is too long from front to back, the same thing occurs.

The desk should be of such a height that when the elbow rests at the side, bent at right angles, it can lie on top of the desk. The desk should slope one inch in six, and should overlap the seat by at least two inches. If the desk is higher than this, it raises the elbow and brings a needless strain upon the back muscles. If it is too far

in front of the seat, the child is obliged to perch on the seat-edge in order to write, and all the back muscles are strained. He should be able to write while leaning back in the chair.

These requirements are the same for both children and adults, but are of especial importance for children, because the body is more plastic, and more easily changed in shape, and because children become fatigued more easily than their elders.

Such seats as these here described should be secured for all schools. If possible, they should be adjustable, so that each child can be fitted to a seat. Where that expense is too great, each room should have at least a few adjustable seats so that the unusually large and small pupils can be suited.

REFERENCES

Child Hygiene and Diseases

Andrews, J. G. *Age Incidence, Sex and Comparative Frequency in Disease.* Baillière. 1909, 439 pp.

Armstrong and Fortescue-Brickdale. *Infectious Diseases occurring in Schools.* Bristol, 1912, 141 pp.

Baby Saving Show of Philadelphia. Pub. by Child Hygiene Association, Phila., 1912. $1.00.

Baker, Josephine. Reduction of Infant Mortality. *N. Y. Med. Jour.*, 1911, 1067–1069.

Blagg, Helen M. *Infant Mortality in United States*, Lond., 1910, 44 pp.

Budin, Pierre. *The Nursling* (trans. by W. J. Maloney.) Caxton, 1907, 158 pp. (Standard.)

Burnham, W. H. Hygiene of the Nose. *Ped. Sem.*, 1908, 155-169. Bibliog.

Campbell, C. M. Skin Diseases in Childhood. Pub. by "Baby," *Mother's Mag.* Lond., 60 pp.

Cotton, A. C. *Care of Children.* Chicago, 1907, 199 pp.

Crowley, R. H. *Hygiene of School Life.* Lond., 1910, 403 pp.

Fell, A. S. Prevention of Spread of Contagious Disease. *Am. Jour. Pub. Hygiene.* N. S., 1910, 82-91.

Forsyth, David. *Children in Health and Disease.* Murray, 1909, 366 pp.

Gorst, John E. *Children of the Nation.* Lond., 1906, 297 pp. (Good.)

Greene, H. C. Opthalmia Neonatorum. *Jour. Am. Pub. Health Assn.*, 1911, 455-459.

Hermann, Chas. Prevention of Spread of Contagious Disease. *Int. Arch. of School Hygiene*, 1909, 1-20.

Hoag, Ernest B. *Health Index of Children.* San Fran., 1910, 188 pp. Bibliog.

Holt, Emmett L. *Diseases of Infancy and Childhood.* Appleton, 2d ed., 1902, 1161 pp. (Standard.)

Huddersfield (Eng.) Rept. Inf. Mort., 1908, 144 pp.

Koplik, Henry. *Diseases of Infancy and Childhood.* Lea and Febiger. 3d rev. ed., 1910, 895 pp. (Standard.)

Lane-Claypon. Janet E. Waste of Infant Life. *Nineteenth Cent.*, 1909, 48-64.

Mackenzie, W. S. *Health and Disease.* Lond., 1911, 254 pp.

McCleary, G. F. *Infantile Mortality and Milk Depots.* Lond., 1905, 135 pp.

Minot, C. S. *Problem of Age, Growth and Death.* N. Y., 1908, 280 pp.

Morrow, Prince. Problem of School Hygiene. *Med. Times*, 1909, 161-166.

Mortality, Infant. Bulletin of American Academy of Medicine, 1909, 347 pp.

Mortality, Infant, Reports of American Association for Study and Prevention of, beginning in 1910.

Newman, Geo. *Infant Mortality.* Lond., 1906, 356 pp.

Newton, Anne B. *Mother and Baby.* Lothrop, Lee and Shepard, 1912. 238 pp. $1.00.

Notter and Firth. *Theory and Practise of Hygiene.* Lond., 1908, 974 pp.

O'Hea, J. P. *Rearing of Children.* Lond., 1910, 175 pp.

Oppenheim, Nathan. *Diseases of Childhood.* Macmillan, 1900, 653 pp.

Care of Child in Health. Macmillan, 1901, 308 pp.

Phelps, E. B. Infant Mortality. *Am. Statis. Assn.* Vol. XII, *Dec.* 1910, 341-359.

Pisek, G. R. Milk Stations and Reduction of Infant Mortality. *N. Y. Med. Jour.*, 1911, 1065-1067.

Pyle, W. L. (ed.). *Manual of Personal Hygiene.* Sanborn Co., 1907, 451 pp. (Very good as an untechnical but reliable presentation.)

Ravenhill, Alice. *Practical Hygiene.* Lond., 1907, 744 pp. Bibliog.

Saleeby, C. W. *Health, Strength and Happiness.* N. Y., 1908, 448 pp.

Stables, W. G. *Parent's Guide to Children's Ailments.* Lond., 1909, 236 pp.

Starr, L. *Hygiene of the Nursery.* 7th ed., Phila., 1906.

Tucker, Blanche. *Care of Babies and Young Children.* Longmans, 1907, 67 pp.

Wallin, J. E. W. Infant and Child Orthogenesis. *Psy. Clinic.*, Nov. 1912, 153-173.

Welpton, W. P. *Physical Education and Hygiene.* Lond., 1908, 383 pp.

Wheeler, Marianna. *The Baby.* Harper, 1901, 189 pp.

White, G. T. Statistics of Infant Mortality. *Survey*, 1910, 877-884,

Wright, Lucy. Opthalmia Neonatorum. *Nat. Con. Char. Corr.*, 1910, 357-364.

See also, reports of the *International Congress for Welfare and Protection of Children*, beginning in 1899, and of the *International Congress of School Hygiene*, beginning in 1907.

Posture

Bancroft, Jessie H. *Posture of School Children.* Macmillan, 1912, 327 pp. (Carefully chosen bibliography. This book is invaluable to any teacher, and is the only one of its kind so far. It puts together numerous things that have so far been widely scattered.)

See also, Articles on School Furniture, under School Hygiene.

Teeth

Bell, V. C. *Our Teeth. How to Take Care of Them.* Young Am. Pub. Co., N. Y., 2d ed., 1900, 77 pp. (Very simple and good.)

Burnham, W. H. Hygiene of the Teeth. *Ped. Sem.*, 1906, 293-306. (Bibliography up to that date.)

Gant, A. W. Dental Inspection in Cambridge (England). *School Hygiene*, 1911, 402-411.

Holmes, Arthur. Can Impacted Teeth cause Moral Delinquency? *Psy. Clinic*, Vol. XIV, 1910, 19-23. (Very interesting case.)

Irwin, A. *Status of School Dentistry, 4th Int. Cong. of School Hygiene*, Vol. II. 349–358.

Kirk, E. C. Dental Disabilities of School Children. *Psy. Clinic*, 1910, 217-223.

Marshall, J. S. *Mouth Hygiene and Mouth Sepsis.* Phila., 1912, 262 p. (Excellent.)

Merritt, A. H. Mouth Hygiene in Relation to Health. *Am. Acad. Pol. and Soc. Sc.*, 1911, 472-486.

Pedley, Denison and Harrison. *Our Teeth.* Blackie and Son., Lond., 1908, 97 pp. (Not so complete as Marshall, but very good.)

Reavis, W. C. Dental Examination. *Ele. Sch. Teach.*, 1910, 90-98.

School Dentists' Society. *Objects and Aims.* Watford, Eng., 1913, 116 pp. (Shows how dentists can deal with the problem of school children's teeth.)

Tremaine, W. F. Dental Irregularities and Mental Infirmities, *Jour. Psycho-asthenics*, 1909, 48-50.

Upton, Henry S. Dental Irritation as Cause of Mental Aberration, *Rev. Neur. and Psy.*, 1910, 457-462.

Wallace, J. S. *Prevention of Dental Caries.* 2d ed., Lond., 1913, 70 pp. (Good and practical.)

Wallin, J. E. W. Medical and Dental Inspection in Cleveland Schools. *Psy. Clinic*, 1910, 93-108.

Experimental Oral Euthenics, *Dental Cosmos*, Apr. and May. 1912, 32 pp.

Sleep

Ackland, T. D. *Hours of Sleep at Public Schools.* Churchill, Lond., 33 pp.

Also in *Lancet*, July 15, 1905, 136-142.

Claperede, Ed. Théorie biologique de sommeil. *Arch. de Psy.*, 1904-5, 245-349. Bibliog.

Collins, J. *Sleep and the Sleepless.* Sturgis and Walton, 1912, 129 pp. $1.00.

Coriat, Isador. Nature of Sleep. *Jour. Abn. Psy.*, 1911, 329-368.

Eurich, F. W. Sleep. *Child Life*, 1910, 69-76.

Foster, H. H. Necessity for a New Standpoint in Sleep Theories. *Am. Jour. Psy.*, 1901, 145-177. Bibliog.

Osborne, Caroline. Sleep of Infancy. *Ped. Sem.*, 1912, 1-48. Bibliog. (This article and that of Terman and Hocking best sum up the matter of sleep for children.)

Ravenhill, Alice. *Some Characteristics of Childhood.* Leeds, 70 pp. Sleep among School Children. *Int. Arch. für Sch. Hygiene*, Apr., 1908, B. 5, H. 1, 8-25. (Excellent on English children.)

Rowe, E. C. Hygiene of Sleep. *Psy. Rev.*, 1911, 425-432.

Sidis, Boris. *Experimental Study of Sleep.* Boston, 1909, 106 pp.

Terman, Lewis M. and Hocking, Adeline. Sleep of School Children. *Jour. Ed. Psy.*, Mar., Apr., May, 1913. Bibliog. (*See* Osborne above.) *See also* 4th Int. Cong. School Hygiene, Vol. II. 38-47.

DIET

Bean, C. H. Starvation and Mental Development. *Psy. Clinic*, 1909, 78-85.

Bell, Sanford. Psychology of Foods. *Ped. Sem.*, 1904, 57-90. (Almost the only study on the psychological aspects. Gives a long list of children's food experiments, likes and dislikes, etc.)

Benedict, F. G. Mental and Muscular Work and Nutritive Processes. *Proc. Am. Phil. Soc.*, 1910, 145-163.

Brown, D. R. *The Baby.* Whitcomb and Barrows, 1908, 193 pp.

Bryant, Louise S. *School Feeding.* Lippincott, 1913, 345 pp. $1.50. (An authoritative survey of conditions.)

Cannon, W. B. Real Nature of Hunger. *Pop. Sc. Mo.*, Sept. 1912, 291-307. (Recent experiments. Cannon is one of the authorities on this subject in this country.)

Chittenden, Russell H. *The Nutrition of Man.* Stokes, 1907, 301 pp. (One of the standards.)

Davis, N. S. *Food in Health and Disease.* Blakiston, Phila., 1912, 449 pp. $3.50.

Denyer, C. H. Feeding School Children at Public Expense. *Econ. Jour.*, 1906, 617-622.

Elliott, C. A. Feeding by the State. *Nineteenth Cent.*, 1909, 862-874.

Fitz, Rachel K. and Geo. W. *Problems of Babyhood.* Holt, 1906, 121 pp. (*See* sections on Food and Diet.)

Food Reform Association, National. Report on Diet and Hygiene in Schools. London, 1912, 467 pp.

Hall, G. S. Hygiene of Appetite. *Trans. 4th Int. Cong. School Hygiene*, 1913, Vol. I. 332-336.

Hall, Winfield S. *Nutrition and Dietetics.* Appleton, 1910, 298 pp.
Heron, David. *Mental Defect, Malnutrition.* Dolan, Lond., 1911, 34 pp.
Holt, Emmett L. *Care and Feeding of Children.* Appleton, 66 pp. (Standard. Widely used.)
Hunt, Caroline L. Daily Meals of School Children. *Wash. Govt. Print.*, 1909. Bull. No. 3, 62 pp. Bibliog. (Standard. Gives dietaries, etc.)
Hunter, Robert. Social Significance of Underfed Children. *Int. Quart.*, 1906, 324-341.
Kellogg, J. H. Unwholesome Diet . . . in School Children. *Tran. 4th Int. Cong. School Hygiene*, 1913. Vol. II. 96-105.
Kerley, C. G. *Short Talks with Young Mothers.* Putnam, 1909, 327 pp. (*See* sections on Food.)
Loch, C. S. Feeding of School Children. *Yale Rev.*, Nov. 1906, 230-250.
MacCarthy, F. H. *Hygiene for Mother and Child.* Harper, 1910, 286 pp. (*See* sections on Food.)
Myers, Bernard. *Care of Children.* Lond., 1910, 161 pp.
Osborne, Lucy A. School Luncheons. *Ped. Sem.*, June 1912, 204-219.
Richards, Ellen. *First Lessons in Food and Diet.* Whitcomb and Barrows.
Richards and Talbot. *Food as a Factor in Student Life.* (Excellent.)
Rockwood, Laura C. Food Preparation. *Pop. Sc. Mo.*, 1911, 277-298.
Sadler, S. H. *Infant Feeding by Artificial Means.* Routledge, Lond., 1909, 241 pp.
Schuyten, M. C. Coefficient of Nutrition in Antwerp School Children. *4th Int. Cong. School Hygiene.* Vol. II. 106-109.
Tallman, R. W. Taste and Smell in Diet. *Gale's Psy. Studies*, 1900, 118-138. (A psychological survey, very suggestive.)
Thompson, W. G. *Practical Dietetics.* Appleton, 1903, 814 pp. (Standard.)
Vincent, Ralph. *Nutrition of the Infant.* Baillière, 1904, 304 pp. (Good.)
Winder, Phyllis D. *Public Feeding.* Longmans, 1913, 84 pp.

VENTILATION AND AIR

Benedict and Higgins. Effects on Men at Rest of Breathing Oxygen. *Am. Jour. Phys.*, 1911, 1-28.

Billings and Bergey. Composition of Expired Air. *Smith. Cont. to Knowl.* Wash., 1905. Vol. XXIX, 81 pp.

Burnham, W. H. Fatigue in Relation to Need of Oxygen. *Proc. Am. School Hygiene Assn.*, N. Y., 1911, 81-87.

Oxygen Supply as Condition of Efficient Brain Activity. *Jour. Ed. Psy.*, 1911, 421-428. Bibliog.

Carrington, T. S. *Fresh Air and How to Use It.* N. Y., 1912, 215 pp. $1.00.

Haldane and Priestley. Lung Ventilation. *Jour. of Phys.*, 1905, 225-266.

Hill, L. Stuffy Rooms. *Pop. Sc. Mo.*, Oct. 1912, 374-396.

Hill and Flack. Influence of Oxygen Inhalation on Muscular Work. *Jour. of Phys.*, 1910, 347-372.

Hines, L. N. School Room Temperature and Work of Pupils. *Psy. Clinic*, 1909, 106-113.

Macfie, R. G. *Air and Health.* Methuen, Lond., 1909, 345 pp.

Müller, J. P. *The Fresh-Air Book.* Stokes, 1910, 152 pp.

Northrup, W. P. Good and Bad Air and Effects on Children. *Ped. Sem.*, 1909, 442-444.

Rosenau and Amos. Organic Matter in Expired Breath. *Jour. Med. Res.*, 1911, 25-84.

Titchener, E. B. Psychophysics of Climate. *Am. Jour. Psy.*, 1909, 1-14.

Tuberculosis in School Children. *Fourth Annual Conference National Association for Prevention of Consumption.* Lond., 1912.

Wachenheim, F. L. Tuberculosis in School Children. *Ped. Sem.*, 1909, 378-384.

Open-Air Schools

Alden, Geo. A. Open-Air Schools. *Pub. Health.* 1912, 249-259.

Ayres, Leonard. *Open-Air Schools.* Doubleday, Page and Co., N. Y., 1910, 165 pp. (Most complete survey.)

Byles, A. H. Open-Air School. *World's Work.* 1909, 197-208.

Carrington, T. S. How to Build and Equip an Outdoor School. *Survey*, 1910, 144-151.

Clark, Ida H. Open-Air Schools. *Proc. N. E. A.*, 1909, 894-901.

Colton, Margaret. Out-of-Door Kindergarten Sessions. *Proc. N. E. A.*, 1910, 410-413.

Curtis, Elnora. Open-Air Schools. *Ped. Sem.*, 1909, 169-194. Bibliog. (Best *article* in English.)

Dew, L. E. Open-Air Schools for Abnormal Children. *World To-day*, 1911, 557-564.

Hine, Lewis W. School in the Park. *Outlook*, 1906, 712-719.

Ingram, Helen. Value of Fresh-Air Movement. *Rept of Nat. Con. Char. Corr.*, 1907, 286-294.

Kingsley, S. C. *Open-Air Crusaders*. United Charities of Chicago, 1910, 107 pp. (Inspiring account of work in Chicago.)

Morin, Jeanne. Open-Air Schools in France. *Wide World*, 1909, 196-201.

O'Hagan, Anne. Open-Air Schools. *Munsey*, Apr. 1911, 70-80.

Watt, Wm. E. *Open-Air*. Little Chronicle Co., Chicago, 1910, 82 pp. (Interesting account.)

SCHOOL HYGIENE AND SANITATION

Barry, W. F. *Hygiene of the Schoolroom*. Snow and Farnham, Providence, 1903, 167 pp.

Briggs, W. R. *Modern American School Buildings*. N. Y., 1902, 411 pp.

Burgerstein, Leo. Sanitation and School Work. *Ped. Sem.*, 1910, 16-28.

Relation of Body to Mind. *Ibid.*, 29-39.

Burgerstein and Netolitzky. *Handbuch der Schulhygiene*. Barth, Leipzig, 1912, 548 pp. (One of the best on the subject.)

Burrage and Bailey. *School Sanitation and Decoration*. Heath, 1899, 191 pp.

Conservation of School Children. Conference at Lehigh University, 1912. *Am. Acad. Med.* (Articles by authorities on teaching hygiene, sex hygiene, defective children, feeding, etc.)

Cotton, F. J. School Furniture for Boston Schools. *Am. Phys. Ed. Rev.*, Dec. 1904. (Good.)

Crowley, R. H. *Hygiene of School Life*. Lond., 1910, 403 pp. (Good.)

Dresslar, Fletcher B. *School Hygiene*. Macmillan, 1913, 369 pp.

Egbert, Seneca. *Hygiene and Sanitation*. Lea and Febiger, 1910, 508 pp.

Gerhard, W. P. *Sanitation of Public Buildings*. Wiley and Sons, 1907, 262 pp.

Herman, Ernst. The Physical Phase of the School. Series of articles in *Jour. of Ed.*, 1909.

Hutt, C. W. *Hygiene for Health Visitors, School Nurses and Social Workers*. Lond., 1912, 415 pp. (A practical compendium.)

Kelynack, T. N. (ed.). *School Life.* Lond., 1911, 159 pp.

Mackenzie, R. L. School Life and Curvature of the Spine. *Proc. N. E. A.*, 1898, 938-949.

McGown, W. E. Sanitary Condition of a Public School Building. *Ped. Sem.*, Dec. 1910, 480-490.

Moore, J. A. *The Schoolhouse, its Heating and Ventilation.* Boston, 1905, 204 pp.

Nice, Leonard B. Disinfection of Books. *Ped. Sem.*, 1911, 197 204.

Putnam, Helen C. *School Janitors, Mothers and Health.* Am. Acad. Med. Press, 1913, 201 pp. (Written for mothers, very simply but accurately, with practical suggestions.)

Richards, Ellen. *Sanitation in Daily Life.* Boston, 1907, 78 pp. (Good.)

Rowe, Stuart E. *Lighting of Schoolrooms.* N. Y., 1904, 85 pp. Bibliog. (Good.)

School Furniture. Boston School Committee Report, 1901-5. (Good.)

Sever, J. W., School Desks and Chairs . . . in U. S. *4th Int. Cong. School Hygiene*, Vol. II, 676-691.

Shaw, E. R. *School Hygiene.* Macmillan, 1901, 255 pp.

Stecker, W. A. Desks for School Children. *Mind and Body*, Apr. 1911. (Good.)

Wheelwright, E. M. *School Architecture.* Rogers and Manson, Boston, 1901, 324 pp., with many plans.

Wisconsin Department of Education, *The School Beautiful*, by Maud Barnett, pub. by Wis. Dept. of Ed., 94 pp.

See also Report of Schoolhouse Commission, *Wash. Govt. Print.*, 1908, with numerous plans, pictures, estimates of cost, etc.; and Report of Woman's Association for Betterment of Public School Houses, in *Report of State Superintendent of North Carolina*, 1905, 60 pp., which contains pictures of old and new buildings, etc.

For current articles, and information of new movements, investigations, etc., *see* the monthly magazine, *School Hygiene.* (Lond., 1s. per copy.)

Medical Inspection

Burnham, W. H. Medical Inspection in Schools. *Ped. Sem.*, 1900, 70-94. Bibliog.

Cornell, W. S. *Health and Medical Inspection.* Davis Co., 1912, 614 pp. (The most complete account.)

Gulick and Ayres. *Medical Inspection.* N. Y., 1908, 276 pp. Bibliog.

Harrington, T. F. Medical Inspection. *Proc. N. E. A.*, 1908, 200-210.

Hogarth, A. H. *Medical Inspection.* Lond., 1906, 360 pp.

Jordan, W. R. Medical Inspection. *Paid.*, 1906, 70-77.

Kelynack, T. N. *Medical Examination of Schools and Scholars.* Lond., 1910, 434 pp. Bibliog.

Leipoldt, C. L. *The School Nurse.* Lond., 1912, 197 pp. (The only full account.)

McMillan, Margaret. *Citizens of To-Morrow.* 2d. rev. ed., 1906, 173-187.

Shafer, G. H. Medical Inspection of Schools in United States. *Ped. Sem.*, 1911, 273-314. Bibliog.

Snedden and Allen. *School Reports and School Efficiency for New York.* Com. on Physical Welfare of School Children, N. Y., 1908, 183 pp.

Terman, Lewis M. Medical Inspection in California. *Psy. Clinic*, 1911, 57-62.

For numerous articles on all the above phases of hygiene, *see* the *Trans. of the Fourth International Congress on School Hygiene*, Buffalo, 1913, 5 vols.

CHAPTER IV

Defects of Sight, Hearing, and the Nervous System

THE eye and the ear are the principal channels through which our knowledge comes, and if either of them is defective, the child is seriously hampered in all his work. He himself is not likely to know whether his eyes and ears are perfect, unless they pain him, for he is accustomed to his condition, and naturally supposes it to be like every one else's. We older people must therefore watch over him.

Sight

For defective eyesight, notice the position of each child when reading or writing at his seat. His eyes should be about one foot from his book or paper. If the distance varies much from this, he should be given special tests as follows:

Nearsight (myopia). Use Snellen's type test card[1] for this, having the child read the various lines of type at the distances indicated on the card. If he cannot see them at those distances, he is shortsighted and should be taken to an oculist for more careful tests. In reading the type, one eye should be used at a time, the other being left open, but covered by a piece of cardboard.

Farsight (hyperopia). This may be roughly tested by holding a dime two feet before the eyes. If the eyes, in looking at it, turn inwards in a squint, there is probably farsight. It is sometimes supposed that a farsighted eye does not need glasses as much as a nearsighted one,

[1]This can be obtained from any dealer in optical supplies. It costs from 10 to 35 cents.

because objects are plainly seen. This is a mistake. The farsighted eye is under a constant strain in adjusting itself to see any object clearly, and this strain, if neglected, causes headache and nervousness.

Astigmatism may be tested by the radiating lines shown on Snellen's test card. If these lines look markedly different, there is some astigmatism.

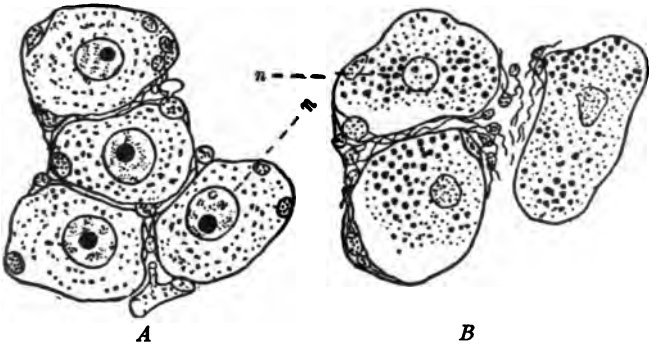


DIAGRAM 2. SHOWING CHANGE IN NERVE CELLS DUE TO AGE: *A*, SPECIAL GANGLION CELLS OF A STILL-BORN MALE CHILD; *B*, SAME OF A MAN DYING AT NINETY-TWO; *n*, NUCLEI. MAGNIFIED 250 DIAM. (Hodge.)

Another condition which the writer believes to be common, but for which, unfortunately, there is no ready test, is that of weakness of one or more of the muscles controlling the movements of the eyeball. If any one of these muscles be weak enough it is perceptible as cross eye, but there are slighter variations not perceptible to sight, which still put too much work upon some muscles in order to compensate for the weakness of the others. With persons who do fine work, such as reading, this may cause great nervousness and recurrent sick headaches. If children have these symptoms, and especially if they complain of pain in the eyeball, these muscles

should be tested along with the other eye tests. Unfortunately, many oculists do not give such tests, and insist that the symptoms are not caused by defects in the eye but by conditions of general health.

Hearing

The ordinary test for hearing is given by means of a watch. First, see how far a person whose hearing is normal can hear the watch that is to be used. Then test the child with his eyes closed, in a quiet room. We may suspect deafness if a child seems dull or inattentive, and constantly asks to have things repeated. Not infrequently growths form in the nose, and the tonsils enlarge, causing a deafness that is easily cured.

In all these cases, the tests are only to ascertain whether a physician's care is needed. The teacher can give a child a front seat if he be deaf, or a well-lighted seat if his eyesight be poor, but such measures are of little use unless curative treatment is also given.

Fatigue: Its cause and significance

When any part of the body is working the cells of which it consists are used up, their structure is changed, and new substances, some of them poisonous in nature, are formed. The nerve cells decrease in size, and some of their connections with other nerve cells are temporarily broken. (See Diagrams 2 and 3.)

If work is continued, the change or tearing down of the cell goes on faster than material to rebuild it can be furnished by the blood; the waste material or poison is left in part about the cell,

DIAGRAM 3. SHOWING CHANGE IN THE NUCLEUS OF A FROG'S NERVE CELL DURING SEVEN HOURS CONTINUOUS ELECTRICAL STIMULATION. (Hodge.)

instead of being carried off to the excretory organs, and in small part is absorbed by other parts of the body through which the blood passes. We then have the condition known as fatigue.

It is evident that fatigue must follow as the result of use of any part of the body, and as exercise is one of the conditions of growth, it is also evident that fatigue is not, by itself, an unhealthy condition. When it sets in, we know that our expenditure is beginning to exceed our income, and while we may borrow and live for a time on our reserve in the bank of health, it behooves us not to overdraw. No disease is so difficult to recover from entirely as is nervous exhaustion.

Conditions of fatigue

The amount of work which causes fatigue has been the subject of careful experiment, so far as fatigue of the muscles is concerned, and of widespread, though not so scientific, observations on mental fatigue. It has been found that in the exercise of any muscle fatigue begins to show after ten or fifteen seconds in a lowering of the rate of movement. After ten or fifteen minutes, the reduction is considerable, but is slower afterwards. There is also a phenomenon comparable to the second wind in running. A muscle can be exercised to the point where the utmost effort of the will is hardly enough to raise the rate perceptibly. If, nevertheless, one continues to move it as much as is possible, it will, after a short time, recover in part its original freshness and move almost as rapidly and as easily as at first. This will happen ten or fifteen times before permanent fatigue ensues.

It is still open to question how far exercise of any one set of muscles wearies the entire body. It does so to some extent, doubtless, because the poisons given off by the muscles in use are taken up by the blood and partially

absorbed by those parts of the body through which the blood passes. It seems likely that exercise of the right hand wearies the left hand to some degree. Many insist that the left side of the body is more developed than it would be as the result of its own exercise, and that this is due to the reaction upon it of the exercise of the right side.

Conditions of mental fatigue

In mental fatigue, as in physical, the immediate condition is the tearing down of the nervous structures more rapidly than they are being built up, but a great variety of causes may lead to this condition. Prominent among them are: overwork; too long hours of work and too much to do in those hours; excessive worry over a reasonable amount of work; wasteful methods of work; not enough work or not enough variety in it; a nervous system so much below par that it cannot do even a rational amount of work.

Overwork in the public schools

There has been of late years a great outcry against the public schools on the charge of overwork. It is claimed that they are fast reducing our children and youth to nervous wrecks, and that this is true not only of Americans but of English and Germans as well. The nervousness of children increases in direct ratio to the number of years that they are in school. Their weight and appetite diminish from the beginning of the school year to the end, especially just before examinations. They have nightmares, grinding of the teeth, and tremors even when they have no well-defined nervous disease.

All these things seem to many physicians the direct result of too much study. In many schools, children even as young as nine years are expected to do some home study, and from that age on the amount of it increases constantly.

On the other hand, the demand is constantly made by superintendents and parents that this or that new study shall be introduced into school. The trades-unions want manual training; the mothers want music and drawing; the colleges demand languages and science. And yet children leave school with the merest smattering of each subject and without knowing how to write a letter correctly. Is the rising generation stupid, that it gets nervous exhaustion in learning nothing?

Overworry, not overwork

This leads directly to the claim made by many observant parents and teachers that the undeniably bad nervous condition of many children is not so much due to the amount that they are expected to learn as to the conditions under which they work. These bad conditions may be either physical or mental. Under mental conditions must be included such things as fear—fear of the teacher's displeasure and of not passing examinations—and rivalries—the intense desire for good marks, the consequent worry over inability to prepare a lesson, and the intense chagrin at failures in recitation or examination. Such conditions are thoroughly artificial and the combined efforts of teachers and parents should be directed toward removing them. Children should feel that they are in school primarily to learn, not to show off, and that a confession of ignorance after an honest attempt to get knowledge is not a disgrace. A give and take among the pupils in helping each other can also be established in any school and family, to replace the rivalries and fears of the other system and to remove one of the great sources of worry.

Not uncommonly we find that a child who seems to be up to the average in brightness takes two or three times as long to prepare a lesson as another child. This

may be due to bad nervous conditions, which we shall consider soon, or to ignorance of how to study. In the latter case, we find that the eyes are constantly wandering from the book, and that there are frequent lapses into daydreams. Even when there is a fair amount of interest in the subject of study, there seems to be an inability to think about one thing for more than a few minutes. The best thing to do with such a child is to study with him for a time, showing him how to look for important points and how to connect them with other things that he knows. Under our present school conditions, this is especially the work of the parents. Under ideal conditions, it might be the work of the teacher, but now she has no time in her day when such work can be done.

Wasteful methods of study

Certain patient German observers experimented upon school children by giving them columns of figures to add for two hours, or copying to do for the same length of time. They found such an appalling increase in the number of mistakes made by the end of the second hour that they forthwith concluded that our schools should all be closed or in ten years no children would be left alive. However, they made the fundamental mistake of supposing that two hours made up of a variety of subjects would be as fatiguing as two hours of one subject. As a matter of fact, variety, while not a complete rest, is a partial rest, and should be carefully observed in making out a school program or in planning a day's work for a child. It is believed that the best hours of work are from nine to eleven; the next best from three to four; and the poorest from eleven to twelve. If we consider this in connection with the requirements of variety, we should have a day's program in which the most difficult subjects were put from nine to eleven;

Monotony of work

from eleven to twelve an hour should be given to subjects much less taxing, like drawing, which also gives some of the relief of handwork after the hard mental work. In the afternoon, the order would be reversed, the easy subjects first, and the more difficult later.

In the demand for variety we find still another argument for handwork, drawing, and music. If any part of the body is left unused for any length of time, there is an irritability, a cry for exercise from the neglected organ. If only one or a few parts of the brain are used, they are over-exercised and other parts are not exercised enough. The result is excessive weariness on one side, and an almost uncontrollable desire for activity on the other. A child brought up in but one line of thought and action is nearly sure to go to extremes in other directions as soon as the external repression is removed. To get a balanced, controlled character, we must cultivate a variety of interests in thought and in action.

Interest

Finally, lack of interest is perhaps the most powerful single factor in producing mental fatigue. The horrible weariness, the indescribable sense of imprisonment to which a child is subjected who is forced to a study which he does not like, is something that we grown-ups will not ourselves endure at all. While I do not think that the school should be a caterer to the passing fancies of its pupils, I do believe that a better arrangement of our curriculum, and wiser and more individual methods of teaching would reveal many interests in children which now we do not suspect them of having. A closer connection of the school with the life of the home and the village or city, and a stronger appeal to the children's love of doing, would accomplish much.

It seems probable, then, upon consideration of the

various causes of mental fatigue, that if the conditions for work were improved by removing causes for worry, by inculcating correct habits of study, and by arranging the curriculum so that it should appeal to natural, permanent, and valuable interests, fatigue would not be as prevalent among school children as it now is. This is true in schools where these changes have been made, and in less time more work is done with more lasting effects than under other conditions. The plea that we should make, therefore, is not for a shorter school day, but for a different one—one full of interesting work and free from worries.

Signs of fatigue

In discussing the causes of fatigue before the signs by which we may know it, we may seem to have put the cart before the horse, but the transition from healthy fatigue to over-fatigue, nervousness, and nervous exhaustion is so gradual that it seems better to discuss them together.

Any person who lives with children at all knows the first signs of fatigue. A child becomes inattentive and fidgety. Ideas not related to the lesson keep coming into his mind and he can with difficulty give even outward attention because his muscles are tired and demand constant movements to ease them. If a five-minute recess is given at this point, there will be a noticeable recovery of attention and of control of the body.

If, on the other hand, work is persisted in without a rest, a child becomes more inattentive, fidgety, and irritable, and less sensitive. Careful tests show that a weary person's skin is not as sensitive to touch, and that his eye cannot distinguish colors as well as when he is fresh. The tired person has not as good a hand-grip or muscular control as the rested one. This shows in the schoolroom when the tired child is duller in recitation

and more awkward and untidy in moving about the room, in writing, etc., than at other times. Such a child is also more likely to be impertinent and undisciplined than when rested and "fit." A good night's rest and plenty of the right sort of food should restore the normal energy.

If even now he has no chance to rest, other symptoms appear. He may have trouble in remembering the names of familiar persons and objects. He is almost sure to forget quickly what he has learned. He is likely to be very irritable, and to pass quickly from the gayest to the most sorrowful mood. He will probably have bad dreams and sleep uneasily. On the motor side, he will be even more fidgety than at first. Certain movements, such as swinging the foot or twitching the fingers, will be kept up incessantly. The facial expression will become exaggerated—the eyebrows twitching, the forehead set in a frown, the lips compressed, the nostrils dilated. The whole body will be in a tense condition even when the child is doing nothing or is asleep.

The nervous child

Such a child is decidedly nervous, although he may not as yet have any nervous disease. He must be carefully watched and relieved from worry and fear, but kept pleasantly occupied. Every effort should be used to build up bone, muscle, and fat. Stimulating foods, and coffee, tea, and chocolate, should be avoided. Long hours of sleep should be secured. Such sensitive children are at once the promise and the danger of the next generation. They may degenerate into hysterical wrecks, or become the leaders of society.

When the nervous condition is permanent, especially if it is inborn, whether or not it be so serious that the child can properly be called neurotic or neurasthenic we get the children who tend to become peculiar or exceptional

in some way. They are more sensitive to everything in their environment than are average children, and whether or not they become efficient members of society depends largely upon their early training. They may have some hysterical or even epileptic tendencies, or may display a lack of mental or moral balance in almost any direction.

Exceptional children

We need not reiterate the importance of good food, good air, and exercise for such a child. Just in proportion as he is unusual, does he need more care taken of his body. His unstable, easily overturned nervous system ought to have all the nutrition possible without stimulation.

Treatment of the exceptional child

For such a child, however, the most troublesome question is how to treat him at home and at school. He is always doing unusual or bad things. He does not get along well with other children. Perhaps he hates school, and he shows all sorts of traits that make him the despair of all who have to deal with him.

We can do nothing whatever with such a child until, with the utmost patience and sympathy, we learn to put ourselves in his place, to look at things from his standpoint, and to see how, from that standpoint, his actions and feelings appear justifiable. This is, of course, true in dealing with any children, but the difficulty in doing it is not usually so great as with the peculiar child. To put ourselves in his place we must get his confidence, and at the same time do some unobserved observing and experimenting, to find out his real interests and make use of them to bring him into closer relations with other people. In every way such a child should be led to feel that he is a valued and needed member of society and that his greatest happiness is in serving others. The criminal is avowedly anti-social; the genius is too often

solitary, if he is not in open opposition to his time. Children with such tendencies need, therefore, not to be marked out and set apart from their little world, but rather to be bound to it by infinite ties of service and affection. Nothing will help an unbalanced person to keep his self-control so much as the knowledge that he has duties and obligations, provided that the service be not so strenuous as to become a source of worry.

While it is not justifiable for any parent or teacher to be ignorant of the greater perils and temptations that face the child of nervous temperament than face the phlegmatic child, neither should they forget that under proper care such a child may become a most valuable member of society. The very instability of the nervous system, that makes him so easily the victim of liquor or vice in any form, also makes it easy for him to adopt new lines of action and thought,—that is, makes him less the slave of habit than other people are. Such a person, when led by high principles and love of the service of his fellows, becomes the hero and leader of his generation. His vagrant, unlawful impulses must in his childhood be given the balance wheel of a noble ideal, and then we may expect almost any good of him.

Neurasthenic children

If, however, the nerve fatigue becomes excessive, these symptoms become still more pronounced. There are usually sleeplessness, morbid and causeless fears, or angers, excessive sensitiveness, crying for no or slight cause, suspiciousness, forgetfulness, and loss of interest both in school work and in play, and so on. Such a child may fairly be called neurasthenic. The causes of the condition are varied. It may be due to bad habits of living—wrong food, insufficient or irregular hours of sleep, bad air—or to overwork and worry in school, to bad home conditions,

to bad inheritance, and so on. Parent or teacher should seek the cause in each case, put the child under hygienic physical conditions and mental and moral conditions free from strain and anxiety, and thus perhaps save him from a life of nervous irritability or from a nervous breakdown.

Another common nervous condition in school children is chorea, usually called St. Vitus's dance. Restlessness and twitching movements, especially of the hands, fingers, arms, and legs, which make the child seem awkward or careless, are the common symptoms of this. Such children should be removed from school for a time, not only to give them the best opportunity for recovery but also that there may not be an epidemic of the disease from other children imitating them.

Chorea

We come next to the large class of children sometimes called backward, sometimes retarded. These children have in common the fact that they are not regularly promoted, but stay in one room two, three, or even more years. Medical inspection, however, has shown that the lack of promotion is due to very different causes. The defects already mentioned, such as persistent ill health, which either keeps the child out of school or makes him unable to work well in school; defective sight or hearing; adenoids; nervousness or nervous disease, and so on, account for a considerable number of these laggards. Another class consists of the truants, and only the third class is made up of the mentally defective children—those who under good conditions are unable to do the regular school work with the average children of their own age. These children fall into two great classes—the dull and listless and the restless and excitable—but in all cases they have little power of voluntary attention and are easily suggestible. It is very difficult for them to study alone, though

Retarded children

sometimes they have good memories. They tend to play with children younger than themselves. Morally they are likely to be deficient also.

Teachers of experience will readily see that normal children may, under bad conditions of health or mental and moral environment, show for a time all these symptoms characteristic of the true mental or moral defective. But the normal child profits by changed conditions, while the defective profits little or not at all. He is incorrigible in the literal sense of that word—incapable of profiting by correction and teaching beyond a certain point, which varies with different children but seems to be rather definite and fixed for each child. To use another common term, he is a case of arrested development.

Mental arrest

Looking at the matter most broadly, therefore, we may say that there are all grades of mental arrest, from the genius to the idiot who cannot even feed himself. University faculties mark off one grade in the requirement for the doctor's degree that the candidate shall present a thesis which makes an "original contribution to the sum of existing knowledge," and varying and indefinite though this standard is, there is a genuine difference between the type of mind which comes up to the requirement with ease and enjoyment and that which with the utmost effort cannot attain it. College and high-school faculties feel corresponding differences between those who can and those who cannot pass the tests for the bachelor's degree and high-school graduation, while the attainment of adolescence, at whatever grade it comes, is the high-water mark of mental and moral attainment for large numbers of young men and women who almost cease to develop after sixteen or seventeen years of age. This is due not so much to lack of opportunity for further schooling as

because they have reached their individual limit of development, and so have no especial interest in going on and could profit little by it if they were forced on.

These, however, are variations within the limits of normality. Practically, we do not speak of mental defect unless it is so serious that the person is incapable of earning his own living or undertaking the direction of his own life. But here again there are all sorts of gradations, from the person who can earn his living under direction, and who has about the intelligence of a twelve or thirteen year old child, down to the helpless, speechless idiot. It is of great importance, both from the standpoint of education and that of the care of such individuals, that there shall be some way of determining just where they stand mentally, and all sorts of tests and standards of intelligence have been proposed for application in schools and in juvenile courts, as well as in institutions for the feeble-minded. One of the most widely used is the Binet system, which has been adapted to American children by Dr. H. H. Goddard. Where so complex a thing as intelligence is involved, no one system can give perfect satisfaction and no system can take the place of experience and skill in the one giving the tests, but, used with good judgment, these tests are of great assistance in classifying defective children. It should be needless to say that they do not indicate the *causes* of the defects discovered, and that these causes may or may not be remediable.

Mental defect

We have already referred to remediable causes. When they are found to exist the treatment of the child is obviously to put him under the proper conditions and see how far he can profit by them. If, however, with the best of care he is not able to profit, but lags behind

children of his own age three, four, or more years, the problem of his proper treatment becomes more serious and embarrassing. There is general agreement that such children should be taken out of the regular school classes and given special instruction in a class by themselves by a teacher who can use methods especially adapted to them. If left in the regular classes, they demand too much of the teacher's time both for teaching and discipline, and so retard the entire class to some degree. They themselves are unhappy and discouraged by the contrast between themselves and the others, and often they are ridiculed by the normal children. If put in a class with children like themselves, they are able to work and learn to the limit of their capacity, and if in addition they can be taught some trade within the limits of their ability they may become self-supporting members of society.

Special classes for defectives

If, however, they lack ability for this, we have the problem of what shall be done with this large class, estimated at about one in every three hundred of our population. Here again specialists are at one upon one point, namely, that such persons must not be allowed to transmit their defect to the generations to come. The studies of Goddard and others in tracing the ancestry of children now in institutions for the feeble-minded show conclusively that this class is largely self-perpetuating and that in the course of five or six generations the state may spend hundreds of thousands of dollars in supporting the descendants of a single feeble-minded man or woman, in jails, in charitable institutions, or in institutions for the feeble-minded. In order to protect itself, society must prevent the propagation of this class.

Subnormal children

The two methods suggested for accomplishing this end

are segregation and sterilization. The latter is now being tried in certain states, and the outcome of the experiment will be watched with great interest. Those who favor this plan believe that the necessary operation leaves no permanent bad effects, and the defective person is thereafter free to live with his or her own family and participate in social life and activity as far as he is able, without at the same time being a menace to society. The state is saved the expense of supporting large institutions to care for this class, and avoids all the difficult problems connected with the administration of the institutions and the training of the inmates.

The older method, and the one still most widely in use, is that of requiring all defectives, especially women, to be segregated in institutions during the reproductive period. Those advocating this method urge that the operation of sterilization has not yet been proved to be free from permanent bad effects, and that, furthermore, defectives in most cases are not happy or useful members of society. If kept by themselves they can be developed to their limit and not be forced beyond it, while out in the world they are almost inevitably forced to a pace too rapid for them to maintain. The expense is, of course, greater at first, but if segregation is strictly enforced, so that there can be no further propagation of this class, it will be greatly diminished in the course of one generation.

There is still another class of children and youth for which the term "moral defectives" has been proposed.

Moral defectives

To some extent this class overlaps that of mental defectives and that of physical defectives, but there is also a remainder in which no mental or physical defect can be discovered, but where there is a lack of moral sense which cannot be counteracted by training or good environment. The range of delinquencies

and crimes is great—kleptomania, pyromania, incorrigible cruelty and love of torturing animals, some cases of sexual crime, some cases of murder, and so on. In such cases there is sometimes an insane heredity, and sometimes a transition later to insanity. It may be that there is always defective development or injury to some center of the brain, but if this is so it cannot yet be demonstrated. Such tendencies are likely to become more pronounced at adolescence, but they may appear between seven and nine years of age, or even earlier. How far they can be corrected if taken in their earliest stages is still unknown. It goes without saying that any teacher or parent will do the utmost to correct them at once, but so far we are unable to deal very effectively with this class because we have no tests to show whether or not the person is incorrigible. Such cases come before the courts repeatedly for the slighter crimes. On the other hand, even though a youth may show tendencies to horrible crime, under present conditions he cannot be put under restraint until the crime is actually committed, and then he must be treated as though he were a normal, responsible person, unless he can be proved insane. But the tests for insanity are themselves fluctuating, and so we go round the circle of ignorance and end in indecision as to the best treatment of this class of "moral defectives."

REFERENCES

SIGHT

Most of the texts on school hygiene and the books on medical inspection contain the tests for sight and hearing.

Allen, E. E. *Education of Defectives.* Am. Book Co., 1911, 52 pp.

Allen, F. Injuries to the Eye caused by Intense Light. *Science,* N. S., 1902, Vol. XV, 109-110.

American Textbook on Diseases of Eye, Ear, Nose and Throat. 1899.

Booth, F. W. Report of Commission on Defective Sight and Hearing of School Children. *Proc. N. E. A.*, 1903, 1036-1037.

Case, G. M. Eye Strain and Crime. *Ophth. Rec.*, N. S., 1906, Vol. XV, 517-533.

Eales, H. Functional Disorders of Vision. *Birm. Med. Rec.*, 1902, 11-26.

Eberhardt, J. C. Examination of Eyes. *Ele. Sch. Teach.*, 1907, 263-268.

Ewing, A. E. *Universal Test Characters as Visual Tests.* Nixon Jones, St. Louis, 1902.

Eye and the Printed Page. Eye movements in reading, right way of reading, how students read—a symposium in *Education*, May 1913, 532-570. (This gives a good brief survey of these phases.)

Gould, G. M. Cause, Nature and Consequences of Eye Strain. *Pop. Sc. Mo.*, 1905, 736-747.

Discovery of Astigmatism and Eye Strain. *Am. Med.*, 1902, 618-622.

Incurable Eye Strain. *Jour. Am. Med. Assn.*, 1906, 734-739.

Eye Strain. *Ibid.*, 847-851.

Harman, N. B. Eyes and Vision of School Children. *School Hygiene.* Lond., 1910, 438-455.

Preventable Blindness (*Ophthalmia Neonatorum*). Baillière, 1907, 9 pp.

Haseltine, B. Eye in Childhood. *Jour. Ophth., Otol. and Laryn.*, 1903, 157-161.

Influence of Schoolbooks upon Eyesight. *Brit. Assn. Adv. Sc.*, 1912 Report, Lond., 34 pp.

Lewis, F. Park. Conservation of Vision. *Proc. N. E. A.*, 1910, 1055-1066; *ibid.*, 1911, 1059-1063.

Lighting and Color Scheme of School Buildings. Rept. of Boston Sch. Com. of Oculists and Electricians, Dec. 1907, No. 14, 20 pp.

Roethlein, Barbara E. Legibility of Printing Types. *Am. Jour. Psy.*, Jan. 1912, 1-36. Bibliog.

Rowe, Stuart H. *Lighting of Schoolrooms.* Longmans, 1904, 94 pp.

Schneider, Rudolf. *Pubertät und Auge.* München, 1911, 17 pp.

School Books. Influence upon Eyesight. Rept. to Brit. Assn. Adv. Sc., Lond., 1912, 34 pp.

Scott, W. D. Sacrifice of Eyes of School Children. *Pop. Sc. Mo.*, 1907, 303-312.

Shawan, J. A. School Activities in Relation to Children's Eyes. *Proc. N. E. A.*, 1911, 1063-1070.

Sight Tests. *Gr. Brit. Dept. Com.* Wyman, Lond., 1912, 219 pp.

Snell, S. Eyestrain as Cause of Headache and other Neuroses. *Lancet*, 1904, 1181-1186.

Stephenson, Sydney. *Eyestrain in Everyday Life.* Ophth. Press.

Wood, Casey A. Schoolroom and Vision. *Ele. Sch. Teach.*, 1906, 62-71.

Wylie, A. R. T. Psychology and Pedagogy of the Blind. *Ped. Sem.*, 1902, 127-160.

HEARING

Andrews, B. R. Auditory Tests. *Am. Jour. Psy.*, 1904, Vol. XV, 14-56; *ibid.*, Vol. XVI, 302-326.

Bentley, I. M. Standards of Audition. *Science*, N. S. 1904, 19, 959-961.

Blake, C. J. Hearing Tests in Public School. *Proc. N. E. A.*, 1903, 1013-1019.

Chrisman, Oscar. Hearing of School Children. *Ped. Sem.*, 1894, Vol. II. (Summary of earlier studies.)

Sight and Hearing in Relation to Education. *Proc. N. E. A.*, 1904, 939-946.

Fuller, Sarah. *How Helen Keller was Taught Speech.* Volta Bureau, 1905.

Grant, D. Varieties of Nerve Deafness. *Jour. Laryn., Rhin. and Otol.*, 1902, 169-178.

Keller, Helen. *Story of My Life.* Doubleday, 1904, 441 pp.

The World I Live In. Century Co., 1908, 195 pp.

Yearsley, MacLeod. Ear and Nose in School Medical Inspection. *The Child.* Lond., Feb. 1910, 84-93.

Acquired Deafness. *Ibid.*, July 1913, 896-906.

Educational Deafness in Children. King and Son, Lond., 1912, 37 pp.

FATIGUE

Abelson, A. R. Mental Fatigue. *Child Study*, 1910, Vol. II, 112-124.

Arai, Tsuru. Mental Fatigue. *Teach. Coll. Cont. to Ed.* Columbia Univ., 1912, 115 pp. (Good.)

Baker, Smith. Fatigue in School Children. *Ed. Rev.*, 1898, Vol. XV, 34-39.

Binet, A. *La fatigue intellectuelle.* Paris, 1898, 338 pp.

Bolton, T. L. Fatigue Problem. *Jour. of Ped.*, 1903, Vol. XVI, 97-123.

Burgerstein, Burnham and Chabot. School Work. *Soc. Int. Cong. School Hygiene.* Lond., 1907, 33-56.

Burnham, W. H. Problem of Fatigue. *Am. Jour. Psy.*, 1908, 385-398. Bibliog.

Donaldson, H. H. *Growth of the Brain.* Chapter on Fatigue. Scribner's. $1.25.

Goldmark, Josephine G. *Fatigue and Efficiency.* Charities Pub. Com., 1912, 591 pp.

Heck, W. H. *Study of Mental Fatigue.* Bell, 1913, 28 pp.

Holmes, Marion. Fatigue of a School Hour. *Ped. Sem.*, Vol. III, 1896, 213. (Supplementary to Burgerstein.)

Hyslop, Theo. B. Brain Fag in Children. *Jour. Prev. Med.*, 1907, 603-612.

Kratz, H. E. Fatigue and Sense Defects. *Proc. N. E. A.*, 1897, 280-284; 1090-1096.

Lagrange, Fernand. *La fatigue et le repos.* Alcan, Paris, 1912, 360 pp.

Lee, F. S. Nature of Fatigue. *Pop. Sc. Mo.*, Feb. 1910, 182-195.

Lombard, W. P. Effect of Fatigue on Voluntary Muscular Contractions. *Am. Jour. Psy.*, Vol. III, 24-42.

Lukens, Herman. Mental Fatigue. *Am. Phys. Ed. Rev.*, May and June, 1899.

School Fatigue Question in Germany. *Ed. Rev.*, Vol. XV, 246-259. (Summary of German investigators.)

Martin, Gladys. Experimental Study of Mental Fatigue. *School Hygiene.* Lond., 1910, 280-284; 314-321; 562-574. Bibliog.

Mental Fatigue during School Hours. *Jour. Exp. Ped.*, 1911, 137-147.

Mosso, A. *Fatigue* (trans. by M. and W. B. Drummond). Putnam, 1904, 344 pp.

Offner, Max. *Mental Fatigue* (trans. by G. M. Whipple). Balt., 1911, 133 pp. Bibliog. (The best on the subject.)

O'Shea, *et al.* Mental Fatigue in School. *Rept. Com. of Ed.*, 1895-6, 1175-1198. (Summary of Warner, Galton, and Spitzner.)

Richter, Gustav. *Rept. Com. of Ed.*, 1894-5, 449-460. (Summary of German studies.)

Thorndike, E. L. Mental Fatigue. *Jour. Ed. Psy.*, 1911, 61-80.

Williams, Alida S. Fatigue from Teacher's Point of View. *Jour. of Ped.*, 1905, 199-213.

Wright, W. R. Effects of Incentives on Work and Fatigue. *Psy. Rev.*, 1906, 23-34.

Yoakum, C. S. Experimental Study of Fatigue. *Psy. Rev.*, Monog. Sup., Vol. XI, No. 3, 1909, 124 pp. Bibliog.

Nervous and Mental Disease

Aldrich, Auretta R. *Children: their Models and Critics.* Harper's, 1893, 158 pp. $0.75.

Aldrich, C. J. Chorea. What is it? *Arch. of Ped.*, 1903, Vol. XX, 827-837.

Bohannon, E. W. Peculiar and Exceptional Children. *Ped. Sem.*, 1896-7, 3-60.

Brigham, A. *Influence of Mental Cultivation and Excitement upon Health.* Hatchards, Lond. $0.60.

Brill, A. A. *Psychanalysis.* W. B. Sanders, 1913, 337 pp. $3.00. (Freudian standpoint.)

Bury, I. *Diseases of Nervous System.* Manchester Univ. Press, 1912, 778 pp.

Carmichael, Jas. *Disease in Children.* Appleton, 520-538. $3.00.

Clouston, T. S. *Neuroses of Development.* Lond., 1890, 138 pp. (Standard.)

Hygiene of Mind. Lond., 1906, 284 pp.

Mental Effects of Child's Environment. Lond., 1911, 17 pp.

Courtney, J. W. Chapter on Hygiene of Nervous System, in Pyle's *Personal Hygiene.*

Conquest of Nerves. Macmillan, 1911, 209 pp.

Deland, Margaret. *Story of a Child.* Houghton, Mifflin, 1892, 220 pp.

Dubois, Paul. *Psychic Treatment of Nervous Disorders.* Funk and Wagnalls, 1905, 466 pp.

Forel, August. *Hygiene of Nerves and Mind.* Putnam, 1907, 343 pp.

Fox, C. D. Psychogenetic Convulsions. *Jour. Abn. Psy.*, 1910, 1-19.

Gard, W. L. Shock. *Ped. Sem.*, 1908, 439-473.

Gould, G. M. *Biographic Clinics.* Phila., 1903-9, 6 vols.

Guthrie, Leonard G. *Functional Nervous Disorders of Childhood.* Lond., 1907, 300 pp.

Hancock, J. A. Mental Depression in Young Women and Children. *Ped. Sem.*, 1907, 460-468.

Hitschmann, E. *Freud's Theories of the Neuroses.* Jour. Nerv. and Ment. Dis. Pub. Co., 1913, 154 pp.

Hoisholt, A. W. Mental States Associated with Chorea. *Am. Jour. Med. Sc.*, 1905, 77-86.

Jones, Ernest. Psychopathology of Everyday Life. *Am. Jour. Psy.*, Oct. 1911, 477-529. (Freudian standpoint.)

Langdon-Downe, R. Neurotic Children. *Paid.*, 1903, Vol. V, 2-11.

Macmillan, Margaret. *Early Childhood* (Feeble-minded child, cost of mental effort, and fatigue). Lond., 1900, 211 pp.

Mercier, Chas. *Crime and Insanity.* Williams, Lond., 1911, 255 pp.
Psychology, Normal and Morbid. Macmillan, 1901, 518 pp.
Conduct and its Disorders. Macmillan, 1911, 377 pp.

Meyer, Adolf. Mental Reaction Types. *Psy. Bull.*, 1908, 245-261.
Preventive Mental Hygiene. *Psy. Clinic*, 1908, 89-101.
The Neurotic Constitution. *Am. Jour. Psy.*, 1903, Vol. XIV, 354-367.

Neu, C. F. Important Points in Nervous and Mental Diseases. *Alien. and Neur.*, 1909, 42-62.

Partridge, Geo. E. *The Nervous Life.* Sturgis and Walton, 1911, 212 pp.

Peckham, Grace. Nervousness of Americans. *Trans. Ill. Soc. C. S.*, 1886, 37-49.

Rachford, B. K. *Neurotic Disorders of Childhood.* N. Y., 1905, 440 pp.

Rayner, H. Early Recognition and Treatment of Mental Defects. *Med. Mag.*, 1899, 451-461; 591-600.

Reynolds, J. R. Influence of Tenement House Life on Nervous Conditions of Children. *Trans. Ill. Soc. C. S.*, Vol. II, 33.

Royce, Josiah. Mental Defects and Disorders from Teacher's Point of View. *Ed. Rev.*, June-Dec. 1893, 299, 302, 449. (Very stimulating.)

Russell, E. H. Exceptional Children in School. *Ed. Rev.*, Vol. VI, 431-442. (Very suggestive.)

Schofield, G. T. *Nervousness.* N. Y., 1909, 80 pp. (Good popular presentation.)

Starr, M. Allen. *Familiar Forms of Mental Disease.* Wood and Co.

Thomas, J. J. Hysteria in Children. *Jour. Nerv. and Ment. Dis.*, 1908, 209-242.

Tuke, Hack. Dictionary of Psychological Medicine. *See* Index.

Warner, Francis. *Study of Children.* Macmillan, 1897, 264 pp.
Nervous System of Child. Macmillan, 1900, 233 pp.

White and Jelliffe (eds.). *Modern Treatment of Nervous and Mental Diseases.* 2 vols., app. 900 pp. each. Lea and Febiger, 1913. $6.00 per vol.

Williams, Tom. A. Psychoprophylaxis in Childhood. *Jour. Abn. Psy.*, 1909, 182-199. Bibliog.

NERVOUS AND MENTAL DEFECTS, ETC.

Arnold, Felix. Classification and Education of Afflicted Children. *Psy. Clinic*, 1908, 180-191.

Ayres, Leonard H. Laggards in the Schools. *Russell Sage Foun.*, 1909, 236 pp. (Survey of the amount and causes of retardation.)

Backward Children. Report of Philadelphia Com., Dec. 31, 1910. Phila., 68 pp.

Barr, M. W. Mental Defectives and Social Welfare. *Pop. Sc. Mo.*, 1899, 746-759.

Feeble-Minded Child. *Alien and Neur.*, 1905, 317-328.

Bibliography of Exceptional Children. *U. S. Bur. of Ed., 1912, Bull. No. 32*, 600 titles. Compiled by A. Macdonald.

Bibliography of Feeblemindedness, annotated. *Training School*, 1910, 213-215; 1909, 11-19, 156 titles.

Bohannon, E. W. *Exceptional Children.* Duluth, 1912, 29 pp. Also *Ped. Sem.*, 1896.

Butler, Amos W. The Burden of Feeblemindedness. *Nat. Con. Char. Corr.*, 1907, 1-11.

Carter, Marion H. Conservation of the Feebleminded Child. *McClure's*, June 1909, 160-171.

Chance, Lydia G. Public School Classes for Mentally Deficient Children. *Nat. Con. Char. Corr.*, 1904, 390-401. (Good survey of conditions at that time.)

Criminals, Mental Defectives: Increase in Massachusetts from 1890 to 1911. Wright and Potter, State Printers, Boston, 1911, 50 pp.

Dawson, G. E. Study in Youthful Degeneracy. *Ped. Sem.*, 1906–7, 221-258.

Characterization of Prevailing Defects. *Ped. Sem.*, 1909, 339-436.

Ellis, Havelock. *The Criminal.* W. Scott, Lond., 3d ed., 1907, 419 pp. (Physical and mental characteristics.)

Exceptional Children. *Proc. N. E. A.*, preliminary report, 1908, 42 pp.

Falkner, R. P. Retardation. *Psy. Clinic.*, 1908, 57-74; 1909, 255-275.

Farr, Wm. Vital Statistics. *San. Inst. G. B.*, Vol. XXIV. (Relation of degeneracy to sterility, idiocy, etc.)

Féré, Ch. Morbid Heredity. *Pop. Sc. Mo.*, July 1895, 388-399.

Fernald, Walter E. Imbecile with Criminal Instincts. *Jour. Psychoasth.*, 1909-10, 16-38.

Mentally Defective Children in Public Schools. *Ibid.*, Vol. VIII, 25-35.

Goddard, H. H. *The Kallikak Family.* Macmillan, 1912, 121 pp. (Showing the heredity of feeble-mindedness, the cost to the state, etc., a very important study.)

Heredity of Feeblemindedness. *Am. Breeders' Mag.*, 1910, 165-178; *Eug. Rev.*, 1911, 46-60.

Numerous articles on mental deficiency and tests in *The Training School, Jour. Ed. Psy., et al.*

Sterilization and Segregation. In Conservation of Children, Am. Acad. of Med., Conf. 1912, 53-62.

Groszmann, M. H. Position of the Atypical Child. *Jour. Nerv. and Ment. Dis.*, 1906, 425-446.

To What Extent may Atypical Children succeed in the Public Schools? *Proc. N. E. A.*, 1904, 754-759.

Harris, W. T. Study of Arrested Development as produced in School Children. *Jour. of Ed.*, 1900, 453-466.

Hart, H. H. Sterilization as a Practical Measure. *Russell Sage Foun.*, 1913, 11 pp.

Extinction of the Defective Delinquent. *Russell Sage Foun.*, 1913, 15 pp.

Healy, Wm. Mentality of Defectives and the Courts. *Jour. Psychoasth.*, 1910, 44-60.

Holmes, Arthur. Moral Imbecile or Bad Boy: Which? *Psy. Clinic*, 1910, 109-116.

Conservation of the Child. Lipp., 1912, 345 pp. (Important.)

Huey, E. B. *Backward and Feebleminded Children.* Warwick and York, 1912, 213 pp. Bibliog. (Good survey.)

Johnstone, E. R. Prevention of Feeble Mindedness. *Jour. Am. Pub. Health Assn.*, Vol. I, 1911, 90-97.

Practical Provision for Mentally Deficient Children. *Nat. Con. Char. Corr.*, 1908, 316-335.

Also various articles in *The Training School.*

Kerr, J. Mentally Defective Children. *Birm. Med. Rev.*, 1905, 251-274.

LaPage, C. P. *Feeblemindedness in Children of School Age.* Manchester Univ. Press, 1911, 359 pp.

Lincoln, D. F. Education of Feebleminded in U. S. *Rept. U. S. Com. Ed.*, 1902, 2157-2197. (Good up to that date.)

Lloyd, J. R. Education of Physically and Mentally Defective Children. *West. Rev.*, 1903, 662-674.

Lombroso, Cesare. *Man of Genius.* Scribner's. $1.25. (Relation between genius and degeneracy.)

Longmead, Fred. Forms of Mental Defect. *School Hygiene*, Feb. 1913, 9-18. (Classification and general survey.)

Maennel, Bruno. *Auxiliary Education. . . . Training of Backward Children.* Doubleday, 1909, 267 pp.

Neighbours, Owen J. Retardation. *Ele. Sch. Teach.*, 1910, 119-135.

Nordau, Max. *Degeneration.* Appleton. $3.50.

Norsworthy, Naomi. *Psychology of Mentally Deficient Children.* The Science Press, N. Y., 1906, 111 pp.

Richman, Julia. Special Classes. *Nat. Con. Char. Corr.*, 1907, 232-243.

Sherlock, E. B. *The Feeble Minded.* Macmillan, 1911, 327 pp.

Shuttleworth and Potts. *Mentally Defective Children.* 3d rev. ed., 1910, 236 pp. (Standard.)

Strayer, G. S. *Retardation and Elimination.* Wash. Gov. Print., 1911, 144 pp. Bibliog. (Good survey.)

Triplett, Norman. Pedagogical Arrests and Peculiarities. *Ped. Sem.*, 1905, 141-157. Bibliog.

Wallin, J. E. W. *Mental Defectives.* Warwick and York, 1912, 155 pp.

Mental Health of the School Child. Yale U. Press, 1914, 450 pp.

Witmer, Lightner. *Special Classes for Backward Children.* Phila., 1911, 275 pp. (Most complete account.)

Retardation in Children of the Rich. *Psy. Clinic*, 1907, 157-174.

Criminals in the Making. *Psy. Clinic*, 1911, 221-238.

Retardation. *Psy. Clinic*, 1910, 121-131.

Also various other articles in *Psy. Clinic.*

For other literature, account of present conditions, etc., see *Psychological Clinic, Journal of Abnormal Psychology, Journal of Psychoasthenics,* and *The Training School.*

TESTS OF INTELLIGENCE

Abelson, A. R. Measurement of Mental Ability of Backward Children. *Brit. Jour. Psy.*, 1911, 268-314.

Bell, J. C. Recent Literature on Binet-Simon Tests. *Jour. Ed. Psy.*, Vol. II, 1912, 101-114.

Binet and Simon. *Method of Measuring the Development of Intelligence.* Trans. by Clara H. Towne, 2d. ed. 1913. Chicago Medical Book Co., 82 pp. $1.00. (These are the tests about which the battle is now waging.)

Goddard, H. H. Feeble Minded Children Classified by Binet Method. Binet-Simon scale revised. *Ped. Sem.*, Sept. 1910, 387-397; June 1911, 232-259; *The Training School.*

Healy and Fernald. *Tests for Practical Mental Classification.* Rev. Pub. Co., Lancaster, 1911, 53 pp.

Huey, E. B. The Binet Scale. *Jour. Ed. Psy.*, 1910, 435-444.

Retardation and Mental Examination. *Jour. Psychoasth.*, Vol. XV; *Psy. Bull.*, Apr. 1912, 160-168.

Present Status of Binet Tests. *Psy. Bull.*, Apr. 1912. Bibliog.

Kuhlmann, F. Binet Tests. *Jour. Psychoasth.*, Monog. Sup., Vol. I, No. 1, 1912, 41 pp. (Gives the results of his use of the tests on large numbers of children.)

Schmitt, Clara. Binet-Simon Tests. *Ped. Sem.*, June 1912, 186-200.

Stern, Wilhelm. *Die psychologische Methode der Intelligenzprüfung.* Barth, Leipzig, 1912, 106 pp. (The most critical evaluation of methods. It is to be hoped some one will translate it.)

Terman, L. M. The Binet-Simon Scale. *Psy. Clinic*, 1911, 239-244.

Terman and Childs. Tentative Revision and Extension of Binet-Simon Tests. *Jour. Ed. Psy.*, 1912, 61-74.

Thorndike, E. L. *Theory of Mental and Social Measurements.* Revised and enlarged ed., 1913, 277 pp. $2.50.

Towne, Clara H. Binet-Simon Scale and Psychologists. *Psy. Clinic*, 1912, 239-244.

Wallin, J. E. W. Administration of Binet-Simon Scale. *Psy. Clinic*, 1911, 217-238.

Whipple, G. M. *Manual of Mental and Physical Tests.* Warwick and York, 1910, 534 pp.

For articles and symposiums on the above subjects see also *Trans. of the Fourth International Congress of School Hygiene*, Buffalo, 1913, 5 vols.

CHAPTER V

Feelings and Ideas of Sex

WITHIN the last decade there has been a great awakening as to the importance of instruction in sex hygiene. Among the many factors which have contributed to this may be mentioned the work of eugenic societies, the diminishing birth rate both here and abroad, the increasing knowledge of sexual diseases, and the pathological studies of Freud and his followers. In this country Dr. G. Stanley Hall's great work on *Adolescence* has emphasized as has no other the significance of a normal attainment of maturity both for the individual and society, not merely on the physiological side but still more on the side of character and civilization in their highest phases. We are beginning to understand that no adequate psychology can be written either of the adult or the child mind which ignores this fundamental instinct.

Varied sex manifestations

In the sex instinct the race speaks through the individual. Biologists tell us that though our body dies the germ plasm is immortal. Before any organs are formed in the developing embryo the germinal cells have separated from the other cells, and in them, through inheritance, the torch of life is passed on from generation to generation. As hunger is the fundamental motive for individual preservation, so sex desire is the fundamental motive for race preservation, and both play up and down the gamut of life in infinite forms. So varied and transformed are these that often we should not be

able to recognize them if we could not trace their gradual development.

Early control of related factors

Every organ of the body contributes its quota to our general bodily feeling and affects our state of mind, although we are not usually able to single out each constituent and trace it to its source. We cannot doubt that the reproductive organs add their mite to this fund of common feeling, for it is impossible that any healthy organ should exist without acting and reacting upon the rest of the body. Still, such feelings are very vague in the baby and in the child, and though they are the forerunners of sex desire we should keep clearly in mind the fact that they are to it but as the acorn to the oak. Pathological cases, in which they are exaggerated, give us some hints as to the form they may assume, and such cases have in recent years been especially studied by Freud and some of his pupils. To put the case very briefly, in order to secure the normal development of this instinct, as well as the control, broadening, and sublimation of it, various factors which later may cause abnormalities in this and other fields must be controlled from the beginning of life. Chief among these are the following:

a. Normal and regular habits of feeding and elimination of wastes, beginning even with the little baby. Anything that contributes to inflammation or prolonged tension here, or to overmuch thought and feeling about these functions, also tends to react upon the sex instinct by laying the basis for a passionate and irritable temperament.

b. Children, as well as adults, fall into two great types of the passive and the active, or those who do and those who endure. In the normal person the two factors are balanced, the excess in one direction or the other being

slight. Such a balance can be to some degree obtained by noting the natural tendency in the first three years of life, and developing the opposite one. Great excess in either direction leads to distinct types of defect, if not of abnormality, in all the relations of life, sex relations among the others.

c. The especial attraction of children for the parent of the opposite sex is well known, and is of especial importance when we consider that the boy's and the girl's ideal woman and man are almost entirely shaped by the father and mother. The qualities of the mate whom the children will later choose are those loved in the parent, and the child who loves the parent too much or too narrowly, or who loves undesirable traits, is thereby hampered in his choice, and is also likely to love his mate unwisely or wrongly. To state it somewhat differently, the mother and father, in stimulating and shaping the love of their children toward themselves, are at the same time broadly outlining the attitude of the children toward their own as well as toward the opposite sex, both as to habits of acting and speaking and as to ideals.

d. Closely connected, probably, with the attraction of the child to the parent of the opposite sex is the child's curiosity over sex matters. Some physicians assert that even the little child of three or four years is especially wide awake to such things as complete nudity, words and acts heard and seen without full understanding, and so on. We may perhaps question whether this is true, in a normal child. But it is true that by the time a child is four years old he usually begins to ask questions about the new baby, and whether he keeps a normal attitude or is forced into one of morbid curiosity depends upon the answers he first gets. Here the whole problem of sex instruction is involved, and this we will take up shortly.

e. We know little of the sex consciousness of children between four or five years of age and puberty. We should expect to find a marked change coming between seven and nine with the other changes in interest and attitude at that age, but few studies of value have been made. It is sometimes called the latent or mental period.

f. At some time between eleven and sixteen years (and even earlier or later in exceptional cases) comes the characteristic development of puberty. We can only refer in the most cursory way to these changes.

1. The first marked change is a rapid growth in height, which is soon followed by increase in weight. These of course involve growth of the bones and muscles as well as of all the internal organs, and are accompanied by changes in the functioning of the organs and in the feelings and sensations naturally associated with these activities.

Changes at puberty. 1. Physical

2. Changes in the circulatory system, especially in the relation between the heart and the arteries, are marked and sometimes make especial care necessary for a time. The heart increases more relatively than the arteries, reversing the condition existing in children, and this means greatly increased blood pressure at puberty, and a slight increase in bodily temperature. The quantity of blood increases relative to the body weight, the specific gravity increases (more in girls than in boys), and other changes in the composition also occur in both sexes. The frequency of the heartbeat lessens, and probably the strength increases.

3. The lungs, thoracic cavity, and power of expansion increase greatly and are closely related to the changes in circulation.

4. The brain has already reached its maximum weight,

but there is considerable evidence to show that at this period the middle layer of fibers, which connect the different parts of the cortex with each other and upon whose development the growth of intelligence depends, enters upon a rapid and prolonged growth.

5. Skin and special senses. The sense of touch seems to be somewhat less delicate at this age, and the condition of the other sense organs as to increased discrimination is doubtful. It is certain, however, that there is increased *attention* to all these sensations and their æsthetic implications. The adolescent fusses with his skin; develops strong likes and aversions to foods, perfumes and odors, colors and forms, sounds, etc.

6. Various tests of muscular activity show that hand grip, ergograph work, and rate of tapping and reaction time improve greatly at this age, but that accuracy of movement seems not to improve.

7. There is the characteristic change of voice.

8. In addition to the above changes common to both boys and girls, though in different degrees and at different ages, there are also the changes peculiar to each sex in the growth of the reproductive organs.

9. Changes in the feeling and thinking of the youth, and in his attitude toward other persons, are equally marked. The rapid growth of body and of brain fibers means profound changes in all his sensations and emotions and in all his associations. Old ideas are seen in new vistas and perspectives. They acquire meanings, felt to be most deep and weighty, but only glimpsed, mysterious, and therefore attractive. Old interests get a new emphasis, new interests also rise, and it is not stating the case too strongly to say that if any given interest or ideal is to have a chance in later life its seed must be planted now. Ideals in all directions

2. Psychical changes

must be developed—love of nature, love of man, love o God, self-respect, and the sense of honor—all these in al their details must be stimulated and given the righ outlet in action. To all of them the adolescent is highl sensitive if he be rightly approached, but not along th lines of command and prohibition. Just as he is suggest ible, humble, altruistic, glowing with noble desires unde the right conditions, so at other times he is obstinate conceited, selfish, sensualistic, and perhaps cruel an vicious. Some of these alternations are but the reflex o his bodily and especially his nervous instability, an must be ignored until rectified by maturity. Some ar due to unwise treatment by adults, especially to an form of compulsion. Happy is the adolescent boy o girl who feels through this period that his father an mother understand and sympathize. However ignoran the parents, however learned and famed the children i later life, wise and loving care at this time will ensur that the children will to the end of their days rise up an call the parents blessed.

We enter, accordingly, upon the delicate problem of se instruction and sex hygiene. The time is now past whe the need for sex instruction is questioned and we will only indicate in the briefest wa the dangers of ignorance to the little chil and to the youth.

Dangers of ignorance to child

When a little child begins to ask questions about se matters he asks them of servants, playmates, or anybod with whom he associates, as well as of parents. He i almost certain to get garbled and often vicious idea unless the mother takes the matter in hand and es tablishes special confidential relations with him. Ver few parents, rich or poor, can prevent the child ob taining such information from some one. Furthermore

vicious children or servants may teach the child habits of self-abuse unless he is safeguarded by the modesty of knowledge.

The dangers to youth are still more serious when they approach adolescence in ignorance. First of all, if puberty comes upon them unexpectedly there are great mental and emotional bewilderment and anguish. Far from going to the parents for help, the boy and girl who have been left alone in this crisis are likely to conceal the experience as a shameful secret, or to reveal it only to playmates or companions, who may be ignorant or vicious or both. These are the individuals who answer the quack advertisements by hundreds of thousands, and they are fortunate if they are despoiled only of money and do not lose health and virtue as well. Secondly, both boys and girls need to be given simple but important instruction in hygiene, in order that proper sex habits may be formed and the new functions healthily established as soon as possible. Thirdly, both boys and girls, but especially boys, should have some information about contagious sex diseases, which are now known to be widespread in this country as well as abroad.

To youth

So obvious and well known are these dangers that no informed man or woman now questions the need of sex instruction, but there are differences of opinion as to the way in which it should be given, who should give it, and at what age it should be begun. The general consensus of opinion, however, seems to be along the following lines:

First of all, it cannot be said too emphatically that nothing can equal the wise and loving instruction of a good mother and father. Parents should consider it their highest moral and religious duty to inspire in their children the right feelings and

Home instruction

thoughts toward the mystery of life. If parents fail to do this they have failed fundamentally, and no amount of money, forethought, and love expended in other directions can make good this defect. The home is the natural and the best place for sex instruction.

Under the present conditions in this country, however, we must admit that many parents—perhaps even the majority—fail here. Accordingly, many are urging that there should be classes for adolescent boys and adolescent girls in connection with the public schools. The teacher should be a woman for girls and a man for boys, preferably a physician, but also a person of attractive personality, of refinement, and with skill in dealing with adolescents. This general plan is being tried in various places and it meets with great success when the teacher wins the confidence of the pupils and the parents.

School instruction

For the matter and methods of sex instruction the most authoritative statement is that of the report of the special committee on this subject, issued by the American Federation for Sex Hygiene. The following are their recommendations:[1]

Matter and methods

"1. Sex instruction has a purely practical aim . . . to impart such knowledge of sex at each period of the child's life as may be necessary to preserve health, develop right living, and control conduct. Its aim is both hygienic and ethical. . . . In all cases, however, temptations should be anticipated by the instruction necessary to protect the child from physical or moral harm.

"A further aim of such instruction . . . is to develop a healthier public sentiment in regard to sex. . . . Moreover, a knowledge of the marvelous processes by which life is perpetuated from its lowest forms to its highest,

[1] *Report*, copyrighted by the Federation.

impresses on the mind more firmly than is possible in any other way the sacredness of human reproduction and the dire consequences to future generations of wrong sexual conduct.

"2. . . . Sex instruction . . . must not seek to create interest and awaken curiosity in the subject with which it deals, but merely to satisfy the curiosity which spontaneously arises in the child's mind by answering his questions truthfully, but only so completely as may be necessary to give proper guidance to his conduct, both hygienic and ethical. The less children and youth think of sex, and the later they mature sexually, the better both physiologically and ethically. Premature development of the sex consciousness and the sex feelings is harmful. . . .

"3. It follows, from the above principles, that detailed descriptions of external human anatomy are to be avoided, and that descriptions of internal anatomy should be limited to what is necessary to make clear and to impress the hygienic bearing of the facts to be taught. The details of human embryology . . . should likewise be avoided. In printed books and leaflets, cuts illustrating human anatomy should be avoided wherever possible, and if used at all should be limited to the absolutely essential facts, and be conventionalized for the purpose as much as scientific accuracy will permit. . . . Danger to the movement might conceivably come from lack of judgment or excess of zeal on the part of its friends.

"4. The purely scientific basis for such instruction must be laid in the biological nature study in elementary schools and in the more systematic instruction in biology and hygiene in secondary schools and colleges.

"5. It must be supplemented by providing physical exercise; by insisting in the home on regular hours of

sleep; by providing adequate facilites for play and wholesome amusements; by protecting children from the unwholesome associations and corrupting influences of debasing shows and immoral literature; and by maintaining the confidence of children in their parents and teachers, so that signs of danger may be the more promptly detected.

"6. The purely scientific instruction must be reinforced as strongly as possible by ethical instruction, both direct and indirect, with due regard to the maturity of those taught . . . in secondary schools and colleges; and certain phases . . . in the upper classes of the elementary schools. Appeals to the sense of personal self-respect and purity and to the instinct of chivalry can be effectively made in the earliest years of adolescence, and even before. With relatively mature students the vast sociological bearings of the subject, with their ethical implications, can be effectively utilized.

"Among the means of indirect ethical instruction for this purpose, the most effective is good literature. It is of immense consequence that during the adolescent years the pupils' minds be saturated with the great masterpieces both in poetry and prose, which deal with romantic love in its purest forms. Thoughts of sex and sex emotion must at this time be spiritualized and placed on the highest plane, and good literature is the most effective means to this end which is available in the public schools. Any kind of sex education which ignores the education of the emotions, is seriously defective. Deep intellectual interests, enthusiasm in art, or ardent devotion to some worthy practical cause, absorb the mind and furnish wholesome avenues for the expression of the emotions. Few conditions are so dangerous at this period as idleness, whether physical or mental, and

an absence of interest in things which appeal to the higher altruistic interests.

"7. The value of physical exercise, especially in the form of play and athletic sport, in its bearing on the control of the sex instinct, is so generally recognized that it needs no special emphasis here.

"8. . . The life of the pupil may be conveniently divided into four periods . . . on a basis of facts both physiological and psychological.

"9. . . From one to six . . . the care of the child falls chiefly on the mother. . . . In lectures on sex education given to mothers, special emphasis must be laid upon this period and proper instruction be given as to the care of the child's body. The danger . . . of an immature or injudicious nurse should be pointed out. Instruction should be given as to how the child's questions relating to the origin of human life may best be answered. This is the only sex instruction a child needs during this first period. In addition to this, watchfulness over the child's habits and protection from untoward influences constitute the mother's chief duty.

"10. . . From six to twelve . . . the school must share with the home the hygienic and moral care of the child; and as most parents are not qualified at present to give the necessary sex instruction to their children, this duty falls mainly upon the school.

"Truthful and delicate answering of the child's questions as to the origin of the individual human life, and instruction which will protect it from forming injurious sexual habits, constitute the chief features of sex instruction during the early years of this period. . . . At this period it is best given privately and should be carefully adapted to the child's individual needs. . . . There should be given during the later years . . . a carefully

planned series of lessons on reproduction in *plants*, as a part of the course in nature study . . . the various methods of fertilization and the necessity of fertilization, and he should be led up to the generalization that plant life always springs from plant life.

"In like manner a series on *animal life below mammals*. . . . The origin of the chick, the fish, and the frog . . . of insects, and finally the necessity for fertilization . . . might form the chief general topics. . . .

"The aim should be . . . to impress deeply the mind of the child with the beautiful and marvelous processes of nature by which life is reproduced from life. . . . It is not necessary and in most cases not desirable that children should make application of this knowledge to reproduction in man before the beginning of adolescence, further than that the human infant is developed within the mother. But such instruction . . . will afterward invest reproduction in the higher animals and in man with a significance and dignity not otherwise attainable, and . . . will create the right emotional attitude toward human reproduction and prepare the child's mind to appreciate its sacredness."

Instruction to children with injurious sex habits should be given privately.

"11. From twelve to sixteen, more facts on reproduction below mammals should lead up to mammals and to the generalization that animal life comes from the ovum. The simple facts of heredity and their application should be given, to show the importance of sexual morality. Girls should receive this instruction about a year earlier than boys, with special instruction on the hygiene of puberty.

"12. During all adolescence, emphasis should be laid on the parent's love and care of the young, the helplessness

of human young, and how it has led to the pairing of couples and to the family; also on the ethical relations of the home, and the fact that every boy owes to every girl the same duty as he would expect from another boy to his own sister.

"13. During adolescence children should understand not only the physical but the psychic, especially emotional changes through which they are passing. Lack of sympathy from the parents now often leads to alienation and loss of control.

"14. Now there should be systematic ethical instruction, of which the ethics of sex relations should form a part.

"15. From sixteen on, there should be more complete instruction in heredity, immorality, and venereal diseases.

"16. It is not desirable that there should be specially set lessons in sex instruction in schools, but such instruction in all but exceptional cases should form a natural part of the courses in nature study, biology, hygiene, and ethics.

"17. All instruction in reproduction in plants and in animals below mammals may be given in coeducational classes. . . . In mammals . . . usually best . . . in separate classes; in human reproduction . . . always . . . in separate classes . . . and a teacher of their own sex.

"18. Certain pupils will always need special instruction, and each class also should be carefully studied, and much left to the tact and judgment of the teacher.

"19. . . . It is not desirable that any teacher should make a specialty of this type of instruction and of no other. We do not want 'sex specialists.' It is better that one of the regular corps of teachers . . . whom the pupils personally know and who has a firm moral hold on them, should give this instruction.

"20. All normal schools and all departments of education in colleges and universities should provide the necessary courses to meet this need (*i.e.* how to give sex instruction).

"21. Sex instruction should be given in the regular evening schools.

"22. Systematic courses at public expense should be given for parents.

"23. Carefully adapted courses should be given in Y. M. C. A. and various types of boys' clubs."

In conclusion, the committee emphasizes the importance of introducing such courses anywhere with tact, and only when public sentiment will support them.

REFERENCES

General Accounts of the Sexual Nature

Ellis, Havelock. *Man and Woman.* Scribner's. 409 pp. $1.25.

Geddes and Thomson. *Evolution of Sex.* Scott, Lond., 1901, 342 pp. $1.50.

Hall, G. Stanley. *Adolescence.* 2 vols., 1904, Appleton. App. 600 and 800 pp. $5.00. (By far the most important book on the subject. Much space is given to the psychological aspects.)

Youth. Appleton, 1906, 379 pp. $1.50. (A résumé of parts of *Adolescence.*)

Hitschmann, Eduard. Freud's Theories of the Neuroses. *Jour. Nerv. and Ment. Dis.*, Mon. series No. 17, N. Y., 1913, 154 pp. (The most important account in English of the Freudian theory of sex.)

Marro, A. *La Puberta.* 1898, 507 pp.

Moll, A. *Sexual Life of the Child.* Macmillan, 1912, 336 pp. $1.75. (One of the very important contributions.)

Northcote, Hugh. *Christianity and Sex Problems.* Davis Co., Phila., 1906, 257 pp. (One of the older books, but excellent in its general standpoint.)

Thomas, I. W. *Sex and Society.* U. of Chicago Press, 1907, 325 pp. (Shows the many ramifications of sex.)

Sex Instruction and Hygiene

Dawson, E. C. *The Book of Honor.* Pilgrim Press, 1910, 192 pp.

Education in Matters of Sex. Soc. of Soc. Hygiene, Chicago, 1907. Ten essays. (Good.)

Ellis, Havelock. *The Task of Social Hygiene.* Lond., 1912, 414 pp.

Foster, W. T. (ed.) *The Social Emergency,* with Introd. by Charles W. Eliot. Houghton, Mifflin, 1914. $1.35.

Hall, G. Stanley. The Pedagogy of Sex. *Educational Problems.* Sex Hygiene in Infantile and Prepubertal Life, 4th Int. Cong. School of Hygiene, 1913, Vol. II, pp. 10-16. Vol. I, 388-540.

Hall, Winfield S. The Conservation of the Child. *The Child,* Chicago, July 1913, 7-14.

Morley, Margaret. *Life and Love.* McClurg, 1899, 214 pp. $1.25.

The Song of Life. McClurg, 1897, 155 pp. $1.25.

The Renewal of Life. McClurg, 1906, 200 pp.

(These three little books are excellent both in manner and matter for parents who wish to learn how to present the facts of reproduction to their children. They are very simple and require no technical knowledge on the part of the reader.)

Morrow, Prince A. *The Relations of Social Diseases with Marriage, and their Prophylaxis.* Pub. by American Society of Sanitation and Moral Prophylaxis. 72 pp. (Gives the prevalence of these diseases, and the proper hygienic measures to prevent their spread and to lead to cure. An authoritative statement.)

Ravenhill, Alice. *Eugenic Education for Women and Girls.* King, 1908, 24 pp.

Sex Hygiene. *Report of Committee of Matter and Methods of Sex Instruction, to the American Federation for Sex Hygiene.* Goldman Co., N. Y., 1913, 34 pp. (The recommendations given here are the consensus of opinion of the best informed persons in this country along these lines. They must be considered as the most authoritative statement yet prepared.)

[It will be noted that no references are given to books for children and youth. There are, almost literally, hundreds of such books on the market, many of them accurate as to their statements of fact. But those with experience are questioning more and more the desirability of giving printed material to young people, at least below college age, unless the circumstances are exceptional. The American Federation for Sex Hygiene, 105 West Fortieth St., New York City,

will give information as to short pamphlets suited to boys and girls, and will send its publications for a nominal price. It will also furnish facts about state and local organizations for sex hygiene. Its information is the most reliable attainable at present, and there is no danger that any one writing to it for assistance will be exploited.]

Eugenics

Davenport, C. B. *Eugenics.* Holt and Co., 1910, 35 pp. (Excellent.)

Dawson, G. E. *Right of Child to be Well Born.* Funk and Wagnalls, 1912, 144 pp.

Ellis, Havelock. *Problems of Race Regeneration.* Lond., 1911, 70 pp.

Eugenics, Problems in. Eugenics Ed. Soc., Lond., 1912, 486 pp.

Eugenics, Twelve University Lectures. Dodd, Mead and Co., 1914, 342 pp.

Ewart, Robert J. Aristocracy of Infancy. *Eugenics Review,* 1911, 143-169.

Jordan, D. L., *The Heredity of Richard Roe.* Boston, 1911.

Jordan, H. E. Rearing the Human Thoroughbred. *Cleveland Med. Jour.,* Dec. 1912, 875-889.

Kellicott, Wm. E. *The Social Direction of Human Evolution.* Appleton, 1911, 240 pp. (Well written popular account.)

Pearson, Karl. *Groundwork of Eugenics.* Lond., 1912.

The Problem of Practical Eugenics. Lond., 1912.

Saleeby, Caleb W. *Parenthood and Race Culture.* Lond., 1909, 331 pp. (Also good popular account.)

Tredgold, A. F. Eugenics and Future Human Progress. *Eugenics Rev.,* 1911, 914-917.

For new aspects of the eugenics movement, the *Eugenics Rev.,* published quarterly by Eugenics Educational Society, London, is the best source of information, and in this country the *Am. Soc. Hygiene Bull.,* pub. monthly from 105 W. 40th St., New York City, 25 cents a year; *also* publications of the Eugenics Record Office, Cold Spring Harbor, N. Y.

CHAPTER VI

Nature versus Nurture

IN the Introduction the fact was emphasized that the body and the mind of each individual child sum up or recapitulate the race experience, but that the later experiences of the race always react upon and modify the inheritance so that the individual at birth is not a bundle of instincts and feelings neatly arranged in order and labeled and tied up so that they cannot be mixed, but at first glance seems much more to resemble the *disjecta membra* scattered over a battle field. Much the same impression is gained by reading various recent attempts to describe this "original nature" or inheritance.

In many cases we cannot even separate the work of nature from the effect of nurture, and a satisfactory classification of inherited tendencies, either from the standpoint of their present value or of their origin, is not to be looked for until we can first say whether they are inherited. At present lists must be admittedly incomplete and classifications admittedly tentative.

Nevertheless, there is a margin of agreement, and we shall pick our way along this as best we can, indicating any deviations into the wilderness of speculation so that the wary reader need not follow unless he be of good courage. We shall attempt only to indicate certain important instinctive tendencies which, in their later development and modification, are educationally important.

Probably the most fundamental aspect of psychical processes is their pleasure-pain aspect, together with the

conscious states rising from movements toward or from the pleasure- or pain-bringing object. In its more complicated forms of satisfaction, enjoyment, happiness, blessedness, and their opposites, this aspect becomes bound up with numerous others and becomes so varied that many students question whether it or the other factors are the motivation for action. The characteristic facial expressions of pleasure and pain are laughing and crying. Laughing probably is a relic of eating movements of satisfaction, while the expression in crying, the shrinking, and so on, originated in the attempt to draw away from the pain-giving object. In general, pleasure results in movements toward and pain in movements from.

Pleasure-pain

Hope and fear—the anticipation of pleasure or pain—are the derivatives of pleasure and pain, and the characteristic attitudes evoked by them are of the utmost significance in education. The child in the presence of an unknown factor or group of conditions at first is hesitant, uncertain, poised between hope and fear, with tendencies stronger in one or the other direction according to his past experience and the superficial aspect of the object in question. Racial experience has inbred a tendency to investigate new things unless they are immediately painful, and we express this by saying that children are naturally curious. They continue to get closer to new objects, to touch, handle, and often to put them into their mouths, unless they get hurt. If the object can be pulled to pieces and put together again, or if it can be used to change other things with—that is, as a tool—it may become the focus of many and often repeated activities.

Hope and fear

If, on the other hand, the object causes pain, the reaction later is some form of fear—caution, withdrawal,

and so on—but if the pain is not too great, and if the object has other qualities that make it desirable, the child is likely to plan some way of using it without getting the pain from it.

Still another situation may arise which evokes very different reactions. If the object cannot be attained, greater desire is first aroused, together with disappointment. There will be more violent movements toward it, probably decided expressions of chagrin, anger, or the like. The later course will depend greatly on the age and temperament of the child. He may simply give up the object, or he may devote himself to working out methods of attaining it.

Some objects, forces, or persons, however, the child is not able to attain or control, and toward these still another attitude may appear—namely, that of awe. They are mysterious to him, sometimes threatening and sometimes blessing, but always stronger than he and moved by springs which he does not understand. He hopes with fear, and fears with hope, and seeks how to propitiate.

Awe

This fundamental attitude of curiosity toward the unknown, with its suggestive mingling of caution and desire, is the basis of the intellectual life. The learning process of primitive man was the process of gratifying his curiosity, as is to-day the learning process of the inventor or the man engaged in original research.

Curiosity

Probably the objects which first arouse curiosity, and which call it out most easily throughout life, are those which may be used for food. Bell has shown how large this class of objects is with little children to-day. Thorndike says that the general tendency to grasp small objects of all sorts is a relic of the

Food objects

food-getting instinct. Whether the love of bright objects has its root here is also a question which may be asked. The resulting movements are also numerous, widely varied, and in many instances not only instinctive but reflex. Most obvious, of course, are those focusing about the mouth—sucking, licking, biting, chewing, swallowing. But many of the movements of hand and arm develop in getting food to the mouth, and locomotion is largely motivated by the search for food. We see this more clearly in animals and among primitive men than among civilized men. The savage, fishing or hunting, obviously moves and uses his hands and his weapons for the sake of appeasing hunger. The weapons themselves—the sling, bow and arrow, fishing net, and so on—were short cuts to food getting, as well as, in some cases, to the destroying of enemies. Again, the savage migrates in search of more food. The civilized man who is following a trade has at bottom this same motivation as the chief one, though beside it are many others which we shall touch upon soon.

Warmth and protection

Things that will keep one warm or make one cold are other objects of perennial interest. Objects that may be wrapped about the body, or that give out heat, are very satisfying. Nooks and niches in trees or rocks that keep off the wind not only have this virtue but also give a feeling of protection and safety which must probably be classed as another instinctive factor. Clothes and dwellings are the outcome of several such factors—of desires for warmth and shelter from weather, safety from wild animals and from human enemies, and also for the satisfying of the tendency to display oneself to the best advantage to others, to arouse in them approval, submission, and so on.

Among the objects arousing instinctive fears are strange

men and animals, especially those which come toward us quickly; black places or holes, black things, and darkness; thunder and lightning; any loud or unexpected noise; and solitude. What the nature of the response will be depends again upon the strength of the stimulus and the age of the child, as well as upon his education. It may be only flight, or shrinking and cowering; it may be fight and anger; or in the final outcome it may be some form of invention or research which gets rid of the fear-rousing condition. The latter is the outcome favored by right teaching; indeed, Stanley Hall goes so far as to say that most of science is simply learning to fear aright and to get rid of unnecessary fears.

Fear objects

The objects most likely to arouse awe are the larger forces and objects of nature. The sky, sun, moon and stars, wind and weather, and unusual occurrences such as earthquakes, volcanic eruptions, eclipses, mountain peaks, great trees, animals with mysterious attributes rarely seen, and also men have all been objects of worship. On the other hand, natural objects and forces which lend themselves to man's needs for food, clothing, or shelter, which he can control and understand, are interesting in quite a different way.

The instinctive attitudes toward other persons fall into at least three great classes,—those toward the opposite sex, toward the same sex, and toward the young,—but each of these is greatly complicated from the start by the family relationship. The attitudes of the unmarried man and woman toward the same and the opposite sex, as well as toward children, are very different from those of the married couple and of parents.

Social interests

As we noted above an instinctive fear of solitude,

here we note an instinctive satisfaction in being with others, a gregariousness, which in its most primitive expression is the enjoyment of physical contact with others —the herding instinct with the sense of warmth and safety that goes with it. In the presence of another person there is an instinctive tendency first to attract his attention, and then to show off or dominate him in some form. In its worse forms this becomes bullying, teasing, and cruelty; in its better, rivalry and emulation. But this domination by no means excludes an instinctive sympathy, which is especially easily called out by the sight of physical pain or hunger or cold. In fact, pity is itself a sort of domination, and therefore agreeable.

It is easy to see in a general way how this gregariousness combines with hunger and fear to form men into communities, but to trace the details of the development would be the history of civilization written from a psychological standpoint, and this has not yet been done. Again, the various complications which lead to religion, art, science, play, and education offer fascinating vistas which we can merely indicate here. All of these, again, are greatly intensified by their complications with the sex and the parental instincts.

Let us outline, now, rather schematically the child's development, indicating roughly how these instinctive bases of education appear at various stages of development.

Interests of babyhood

For the first two months of his life, we may fairly say that the baby's chief interest is in what goes into his mouth. Not only are the lips and the tongue the parts most sensitive to touch, but touch is relatively more developed than are other senses. Hearing is imperfect and sight is short and uncontrolled. The arms and legs are not under control for

grasping and creeping, so that the baby must perforce wait for what comes his way. Furthermore, he spends a large part of his day in sleep. What little display of anger he makes is when he does not get his food promptly. So the baby is a dimly-seeing, dimly-hearing little creature, sleeping much of the time and conscious chiefly of the satisfaction of food.

During the third month, however, with more distinct seeing and the rise of memory, comes a marked interest in seeing things. Now the baby holds his head up, twists his head and body to see things, and studies each thing about him, learning it in its various appearances. The interest in suckable objects continues and is strong, but its prominence is relatively less because visible objects have now become so interesting.

From the fourth to the sixth month, both of these interests continue, and are fed and supplemented by the great interest in graspable objects. Grasping and sucking; seeing and grasping; seeing, grasping, and sucking are now combined and find their satisfaction in superlatively interesting, seeable, graspable, and suckable objects.

The craving of the growing limbs for more exercise results in creeping and later in walking, with the wide range of new activities and interests thus made possible.

Into this little world enter fear and shrinking also, anger, fighting and jealousy, nearly all of them connected with persons, and the numerous satisfactions connected with the mother. With the infant the satisfaction of hunger and of gregariousness, the getting of food and of cuddling and warmth, as they are always associated, are probably never differentiated until he begins to eat solid food. The baby's world is never predominantly a world of things, even when food is his chief interest.

It is a social world—to which he zealously adapts himself from the beginning. Various observers have noted how soon a baby learns to know his mother's arms, and how early she may establish almost any habits she pleases as to ways of holding, associations with food, and so on.

Between the fifth and sixth months a baby begins to repeat many of the movements going on about him. A little later come babbling and the foreshadowing of speech. How far this is due to an instinct of imitation and how far to the spontaneous rise of certain tendencies and the effect of practice is a matter of dispute.

During the first year and a half, then, the baby's interests are first and chiefly those of food and persons, and second, those of controlling the sense organs and the body in general, but especially the organs of locomotion and grasping. By the end of this time he can usually walk, has begun to talk, and can use his five senses with a fair degree of accuracy, though he still is lacking in control in many respects.

Interests of early childhood

From the acquisition of speech to the beginning of the second dentition, the interests of babyhood are still strong, but are shown in more attention to the details of the activities. The child now likes to play games that test the sharpness of the senses; he likes to experiment with new movements—to walk on tiptoe, to skip and dance, to play finger games, to draw, to string beads, and so on.

His interest in persons is even greater than before. His plays at this time are very largely imitative. He imitates persons more than he does anything else. He personifies all sorts of inanimate objects, and the only cause he knows is a personal one. Through his interest in imitating persons he enters into the race interests which are going on about him—learns in a crude way

how we get our food and so on. His interest in language persists in various forms, such as his delight in nonsense rimes and his persistent desire to name all the objects he sees. His love of rhythm is also prominent and is closely connected with the increasing control of his movements.

During the latter part of this period some new and strong interests arise. As memory and imagination develop they introduce the child to another world which he finds that he can change to suit himself, while he cannot so alter the world of his senses. The love of power which in his babyhood was gratified by his new control of his body, now finds another source of gratification in this mental play. We find him, therefore, listening to and inventing tales of marvel and mystery.

The rise of an interest in causes at this time also leads to wonderings and questionings and to speculations sometimes startling in their shrewdness. With many children there also seems to be an interest in enumeration and in quantities, as seen in the love of counting and in the comparisons of size.

In the little child, then, up to the beginning of the second dentition, the interests are to a large extent confined to his delight in the feeling of his own activities and of his increasing control of them. On the physical side this appears in his enjoyment of plays that exercise his senses, in his practice of all movements that are a little difficult for him, and in his use of rhythm and of nonsense rimes. On the mental side it appears in his love of imagining and inventing, in his counting and measuring, and in his ceaseless questioning. The union of the two and also the growth of his social interests are marked above all by his love of imitation, the most characteristic interest of this period.

In these early years the interests are, on the whole,

immediate. The child enjoys the action for its own sake without much reference to any end. Little children who are playing "Pom pom pullaway," for instance, may forget all about the goal in the delight of running, and end the game in a chase. So, also, a little fellow begins to draw the story of the Three Bears, gets interested in making the bear, and covers his paper with bears. The movement or activity is what he enjoys. He does not care for making some *thing* so much as he does for going through the movements of making. On this account a little child is usually easily diverted from one thing to another, if only the new thing allows the same general movements as the old.

Educationally, this is the period when interests can be given a more definite and permanently valuable form if the parent or teacher provide the materials for the child to work with, and surround him with a life that is worth the imitation.

Interests of later childhood

The period from seven to twelve years of age seems to contain at least two distinct subdivisions. From about seven to nine there is a rapid growth of connections between the parts of the brain, and on the mental and emotional sides this is marked by a broadening of interests in various directions. Its character is perhaps best seen in the child's plays. They are individualistic, demand much motor activity, and are to large degree suggestive of primitive race activities. The child enjoys the use of tools, and can adapt means to ends over a wider range than before. There are vivid interests in natural phenomena and forces, in pets, collections, in what can be done with stones and sticks, strings, and like objects. Religious interests are in the Old Testament more than in the New, and in individual heroes. The world of adults is farther

removed from the child than before, and even the attitude toward other children is more that of distrust and competition than of coöperation and confidence. In the latter part of this period boys and girls are more alike than at any other, and both seem to reach a period of relative adaptation and stability for a year or two before the onset of puberty. Hall calls the entire period a savage if not a half animal one, in which the child should come into close contact with natural forces and phenomena on all sides of his nature. He ought to have the opportunity to dig caves, live in tents, migrate in the form of excursions, go on tramping trips or the like, make collections, invent tools, hunt and fish, plant and reap, spin, weave and sew, build, and so on. Morally he is not much developed save in the sense of conformity to custom, and religiously he is more likely to be the victim of superstitions than to be given over to faith.

These interests evidently have important educational bearings. Thus a beginning can be made in history and science, the idea being to find out how people under certain conditions would be obliged to live, how they would be obliged to get food and clothing, and so on. This interest in the "how" of things, Dr. Dewey warns us, however, is of slow growth. It arises in about this order, he thinks: reading, writing, numbers, science, history, and literature. That is, a child first sees the advantage of knowing how to read and is interested in learning words and sentences before he sees the use of learning how to write. His first interest in science and in history is the same as the little child's—the delight in activity and in a good story, but a little later he begins to experiment in science and to reason from cause to effect in history. The interest in *why* has become replaced by a curiosity as to *how* things are done. In

Interests in the "how"

order to hold this interest in the "how" a child must also have experiences that make the "how" of use to him, and he must have some end that *he himself* wishes to reach. This point is too often neglected by teachers. They think that if they themselves see the end, it is sufficient. But if the child does not know what he is working for, how can he be long interested? Or even if he is curious, how can he work at the adapting of his material to what he is making?

Observations

To find out what children's interests are, a series of observations was made by Binet, Earl Barnes, and Shaw in this manner: They made out a list of common words and asked the children to tell them what the thing was which was named. The children were taken separately, so that they could not imitate each other. They were asked no questions and given no suggestions, but left to state their thoughts themselves. Left thus, it was believed that the children would describe the object according to their greatest interest in it. The list of words was as follows:

knife	mamma	earthworm
bread	potatoes	shoes
doll	bottle	finger
water	flour	lock
armchair	snail	horse
hat	mouth	wolf
garden	lamp	omnibus

All three observers found that the children were most interested in what they could *do* with a thing, or in its *use to them.* The great majority of them defined the words from this personal point of view. For example: "A mamma is to kiss me good night"; "A lamp is to give me light."

Next to use, they were interested in things that had action or movement. They showed very little interest in the structure or substance of things, and less than two per cent were interested in form. Only three per cent were interested in color, but the very small percentage in both these cases may be because the words given do not call up these ideas. Very few of the objects mentioned usually have any such coloring or structure as would attract attention. At the same time, it is true that children have little general æsthetic interest in the color of pictures. It is safe to say that practically all children prefer colored pictures to black and white. They also choose pictures which they call "cunning," or "sweet" in preference to the masterpieces. A mother and child is usually preferred to a madonna, and pictures of children, kittens, and puppies in playful antics mean much more than other pictures. Natural and lifelike pictures are preferred to ideal ones, and those that represent activity of some sort to those of quiet scenes. In all this we get again the same truths: childish interests are in the personal and active sides of life.

Interest in color and life

As the children grow older, they define the terms less according to the personal use, and more by putting them into a larger class. Their concepts become more prominent, and the central idea stronger. Formerly it was supposed that reason—of which the idea of cause and effect is a prominent part—did not develop until the age of fourteen or fifteen at least, but we understand now that it is of as long and gradual growth as our other mental powers. Nearly all children ask "why" before they are four years old, and this interest is a constant one, although it is by no means the most prominent one until maturity, if it is at that time.

Another way in which children's interests have been observed is to find out what stories from their Readers they remember best. Nineteen hundred and fifty grade children have been questioned on this point with rather startling results. It was found to begin with that 44 per cent of the pieces in four Readers, or nearly half, were remembered after one term by only 5 per cent of the children. Almost half of the material in these Readers was uninteresting, and this was to a very large extent the instructive and moral parts. The first lesson in each Reader was remembered, and also the long or continued lessons. Those best remembered are, as we should expect, those which are especially natural, and which appeal to the child through experiences similar to his own. We find, for example, that 32 per cent of the children remember stories of life best, and 12 per cent those of animals. Seven and one-half per cent give allegiance to stories with morals, 56 per cent to stories of heroism, and only two per cent to instructive stories. At first the liking for poetry is simply enjoyment of rhythm, and not until adolescence does it begin to be enjoyed as literature. Of course these interests were greatly influenced by the way the stories were told.

Interest in school Readers

The Readers were, if we remember correctly, those in the state textbook series of Indiana, and were considered to be about the average.

G. Stanley Hall's *Contents of Children's Minds* is also a book of great interest here as showing how little many of our school Readers appeal to a child's own experience. Dr. Hall's list of words was obtained in large part from First Readers, and the children's ignorance, as shown, is truly amazing.

Dr. Hall's test

Out of 113 objects,

90%	are	ignorant	of	7	of them;
80 to 90%	"	"	"	14	" "
70 to 80%	"	"	"	10	" "
60 to 70%	"	"	"	21	" "
50 to 60%	"	"	"	17	" "

making an average of over 60 per cent of the children who know nothing of the meanings of over half the words.

With regard to the regular school subjects, observations have also been made on two thousand children above third grade. Arithmetic, history, geography, and spelling are by far the most popular studies, in the order named. Drawing, music, and nature study cannot compete with them. Probably, however, these do not show the natural interests of children, but rather are due to the conditions of this particular school. It is stated that drawing, for instance, is not much emphasized, and again, it is very true that the teacher's interest controls the child's more or less. If there were a good arithmetic teacher and a poor drawing teacher, the child's interest might be just the reverse of his natural interests.

The language interest is small during the first part of this period but seems to revive in the latter part in the secret languages which we shall mention later. This seems to indicate the advantage of beginning the study of foreign languages at this time.

The interest in the use of the senses is at least undiminished, while the love of movement is much increased. The games of this period call for a far greater amount of muscular strength than before.

The interest in persons becomes stronger, and now the child delights in a history that describes heroic deeds.

In all cases an important difference exists between this period and the previous one, namely, that the child

more and more, if given the opportunity, plans ways and means of reaching an end. The little child does this to a very limited extent. This and the greater variety of interests of the later period are due to the rapid growth of association fibers in the brain.

Finally, with the advent of puberty, and the last period of rapid brain growth, the child enters upon the last educational period. The period is now usually estimated to last to the time when bodily growth is complete, at about the twenty-fifth year.

Interests of youth

On the side of interest this period is not so much characterized by the rise of new interests as by the broadening and deepening of those already existent. The senses become more active and consequently there is a keener interest in observation of all kinds, in nature, and in science. The rapid development of the muscular system in boys results in the athletic craze. The wider development of reason appears in the doubts and questionings about the various systems of thought that the youth finds embodied in the school system, the political system, the religious system, and all the other systems.

The most notable development of the period is doubtless the growth of the interest in persons which comes as the direct result of the sexual development of this age. The child now for the first time enters fully into his social inheritance, feeling the bonds which connect him with others and desiring the responsibilities and privileges of all adults. The moral law now appeals to him as a need of his own nature, and the obligation to do good for its own sake now becomes binding. In numerous ways his own individual self is yielded to his social self, in ways both tragic and comic — in the devotion to dress and manners as well as in the abandonment to religious

exaltation. It is hardly stating it too strongly to say that the key to the adolescent is his interest in living up to what he conceives to be the social demands upon him. Control of him lies to a large extent, therefore, in controlling his conceptions of what these social demands are, and this is not a matter that begins only with adolescence.

We have had occasion to remark many times before that social habits must be inculcated from the beginning, and we can now see the importance of this. The youth who has now awakened to a vivid interest in his relations to others has his sense of what these relations should be determined in part by the social habits which he has already acquired, and in part by the customs of the particular people with whom he is now thrown. Where the two sets of customs disagree, as is often the case, the child's consciousness of his own ambiguous position is very keen, and he brings all his judgment and reason to bear upon his decisions as to what he should do. Now he is fortunate if his social habits and his training in independent judgment are such that he can trust to his habits for all the smaller details of deportment and devote himself to the question of what his ideal shall be for the vital questions of life.

Importance of early social training

In the shaping of this ideal or interest, as we have already said, we must call into play all the influences of surroundings—books, pictures, and so on—but more important than any of these to the adolescent is the wise and untiring friendship of some older person, teacher or parent. Fortunate is the youth whose father and mother are his best friends—and sadly lacking in some respect are the parents who have not kept close enough to their children to be their best friends.

We hear a great deal of talk about the importance

of keeping children interested. Unless children like a school duty, a task, a dress, or a certain kind of food, it is assumed that they ought not to be bothered with it. It is claimed they must follow their interests; that is, apparently, their caprices. What right have we to impose our likes on them? They surely should be as free as others to express their whole nature without let or hindrance.

Training and interests

On the other side there are still advocates of the idea that the natural man is full of evil desires, so that the very fact that a child wants a thing is one good reason why he should not have it. Moreover, say these duty lovers, life is full of disagreeable things that must be done. No one can succeed who does not learn to do cheerfully tasks that he dislikes. All progress is made only by pain and suffering in giving up our natural desires and in struggling toward our ideal, which we see is right but do not yet love. Therefore, say these stern teachers, the truest kindness consists in training our children to do work that they do not like. We should not appeal to their interests, but rather to the right, and lead them to make their interests agree with what is right. The happiness of a child is of very little account if only he be led into the paths of righteousness. So hold the two extremes. Probably the majority of parents and teachers hold a middle ground, not believing that the child should be either wholly indulged or wholly thwarted, and indulging or thwarting according to their own particular likes. The mother who likes cabbage and does not like tomatoes, will usually feed her child the same way. The father who never lies, but finds it easy to criticize or backbite his neighbor, will probably rebuke falsehood but let backbiting go unscathed. The parent who dislikes arithmetic and enjoys history finds it easy to

condone his child's stupidity in the first but not in the second. In all cases we seem to lack any standard by which we judge whether or not a given trait in our child should be encouraged, whether or not he should be given freedom to develop his own natural self.

Now it is unquestionably a difficult thing to know what we shall do in any given case. On the one side, we want our children to grow up good citizens, good members of the family, and seekers after righteousness. On the other, we do not want them to be confined, fearful, distrustful of self; we wish them to live a broad, free life, to feel the swing and delight of power, and to live with force and vigor. Between the two we stand puzzled.

Race interests vs. individual interests

If what we have said of social recapitulation be true, a child is at birth a bundle of strong but vague impulses and instincts that have come to him from numberless ancestors, that press him into constant action in this way and in that, and that cause great unhappiness and dwarfed development if repressed.

We have had very elaborate theories worked out of these race-stages or culture-epochs, through which each child passes, and the proper studies for him at each stage, but such theories cannot be said to have scientific value. We cannot say that because the race has gone through a certain stage, therefore the child must go through it. We must instead study children, both individually and collectively, to see what race-stages they do repeat in fact, and the longer this study goes on, the more certain it is that only certain steps of race-progress are repeated in the individual.

Still further, the fact that a child is in a certain culture-epoch does not mean that he must have only literature of that epoch to nourish his mind. It means

rather that he is interested in the prominent *activity* of that period, and wants to go through that activity himself in the rough.

It would be strange indeed if these impulses were either entirely good or entirely bad. They are all survivals of a ruder civilization, and their value must be determined not merely by their antiquity but by their adaptability to present-day conditions. The habitual criminal is looked upon to-day as a person whose interests belong in the ages when violence was necessary to self-preservation; but these interests are not suited to civilized life, and so their possessor must give them up, or go to dwell among barbarians, or be confined in prison. As a rule, however, these instincts and impulses are fluent enough to take the usual social channels. It is the task of the parent and teacher to provide outlets which will utilize these streams of energy, instead of damming them.

Direction better than repression

The training of interests consists, then, primarily in directing impulse and instinct to a worthy end, by all means—suggestion, good surroundings, stimulation of curiosity, and so on. If an impulse can be so employed as to contribute to the family life, the best possible thing is done. If conditions do not allow of this, the parents can at least take a rational attitude toward the children, instead of assuming that all the children want is to make trouble. We find, for instance, that as a rule parents are decidedly opposed to their boys digging caves. Under the usual conditions, where the cave is made a rendezvous for smoking and reading dime novels, there is a good reason for objection. But are such conditions necessary? Surely not. So again, little children who run away do it usually because their own yard is so small and their

companions are so few that they cannot resist temptation. Instead of forbidding them the freedom, we should rather exert our ingenuity to make the freedom safe, for through such wanderings a child acquires valuable independence, gets a sense of direction and distance, and makes his first venture into the social world outside the home.

In general, then, we may say that we should not condemn a child's impulses unless they are of such a definite, fixed, and base nature as to work decided harm to himself or others. We should not try to *repress* impulses so much as to *direct* them into useful channels by suggesting to the children definite and valuable ends to be accomplished.

Talent

The growing appreciation of this truth has led within the last ten years to the systematizing of vocational guidance and the establishment of vocational bureaus, as well as to considerable discussion as to the best way of developing and encouraging talent and genius. It is altogether probable, Gesell thinks, that the average attainment of children in school is below the normal attainment because of our wasteful methods and the failure to take advantage of natural interests and instincts. Such writers as Berle and Sidis, who have attained remarkable results with their own children, emphasize the same points. Whether or not most normal children could be ready for college at twelve or thirteen may be left an open question, without our disputing that our educational methods are extremely wasteful and that our methods of dealing with exceptionally bright children are stupid to the last degree. Defective and delinquent children have the most expensive education in the world. Talented children usually have to make their way against inertia if not opposition.

Vocational guidance in its wider sense should deal

with such children of genius as well as with normal and defective children, but, unfortunately, the tendency has been to narrow the term to finding positions for children who leave the grammar grades. Bloomfield considers the problem almost entirely from the side of what trades are open to children and what are the wages, conditions of work, and so on, in those trades. But more important than this, from the standpoint of the child's development and his permanent service to the community, is the question of what occupation his own individual ability and interests best fit him for. Instead of merely round and square holes there are holes of all shapes and sizes, and to find the shape of the child's mind and the occupation corresponding to it is by no means a simple matter, especially when complicated by the fact that the child must usually choose from the occupations of his own town and is usually under the financial necessity of doing something.

Vocational guidance

The question of tests of intelligence, therefore, comes up here from another standpoint. How far can we ascertain what qualities are necessary for a given trade, and how far can we give a child tests to discover whether or not he has those qualities? It is simple enough to test for color blindness, and to shut out a color-blind man from train service. Can we similarly test a boy who wants to become a civil engineer, or a girl who wants to specialize as a buyer of laces or furs? Münsterberg believes that even now we can to some degree do this. For example, we can give tests for telephone operators which will show whether the candidates have a certain power of auditory attention necessary for an operator. Similarly, artificial conditions can be arranged, he believes, which will test out motormen. So, in the course

of time, tests can be arranged for all callings, and those taking the tests will be automatically sorted out.

Much waste will be prevented if this ever can be done, and it is to be hoped that those now working out tests will be as successful as they desire. At the same time, we can never afford to forget that the character of the whole man is rarely called out by tests under artificial conditions, and that the reserve qualities are those that lead to success or failure when the time of trial arrives. In callings where this or that sense organ must be used in fine discrimination, tests are very valuable, but when interest and judgment are the chief factors involved, the difficulty is tremendous of getting tests that will call them out as the real situation does, however willing the subject may be. Nevertheless, such tests are worth working for.

REFERENCES

The Psychology of Childhood

This list includes books which discuss various aspects of child nature and training. They can be used to good advantage to supplement the textbook. In many instances they have sections on the subjects discussed in the following chapters of this book, and should be referred to. It has seemed desirable to include not only the more voluminous and scientific references here but also some of those written especially for mothers and teachers.

Baldwin, J. Mark. *Mental Development: Social and Ethical Implications.* Macmillan, 1902, 606 pp. $2.60. (A discussion of the effect of society upon the individual.)

Brockbank, E. M. *Children, their Care and Management.* Lond., 1912, 259 pp. (Simple and good.)

Chamberlain, A. F. *The Child and Childhood in Folk Thought.* Macmillan, 1896, 464 pp. Bibliog. of 30 pp.

The Child: A Study in the Evolution of Man. Scott, 1903, 498 pp. Bibliog. of 30 pp. (These two books summarize effectively a large amount of literature upon the parallelisms between child nature and savage and primitive man.)

Claparède, Ed. *Experimental Pedagogy.* Trans. of 4th ed. Longmans, 1911, 332 pp. Bibliog. (Discusses especially history, methods, and fatigue.)

Colvin, S. S. Practical Results in . . . Educational Psychology. *Sch. Rev.*, May 1913, 307-322.

The Learning Process. Macmillan, 1911, 336 pp.

Colvin and Bagley. *Human Behavior.* Macmillan, 1913, 336 pp. $1.00.

Compayré, G. *Intellectual and Moral Development of the Child.* Appleton, 1896-1902, 2 vols.

Development of the Child in Later Infancy. Appleton, 1902, 300 pp.

Davids, Eleanor. *Notebook of an Adopted Mother.* Dutton, 1903, 259 pp. (Good.)

Drummond, W. B. *Introduction to Child Study.* Lond., 1907, 348 pp.

DuBois, Patterson. *Fireside Child Study.* N. Y., 1903, 159 pp. (Very simple. Intended for untrained mothers.)

Point of Contact in Teaching. 1908, 131 pp.

Education, Paul Monroe's Cyclopedia of. Three volumes now out.

Groszmann, M. P. E. *Career of the Child.* Badger, 1911, 335 pp.

Gulick, Luther H. *Mind and Work.* Doubleday, 1908, 201 pp.

Hall, G. Stanley. *Adolescence.* Appleton, 1904, 2 vols. App. 600 and 800 pp. $5.00. (Contains numerous summaries and references to work in child study. *See* Index.)

Educational Problems. Appleton, 1911, 2 vols. App. 700 pp. each. $5.00. (Most complete résumé of recent movements.)

Hall, *et al. Aspects of Child Life and Education.* Ginn, 1907, 326 pp. (Includes papers on contents of children's minds, daydreams, curiosity and interest, sandpile, dolls, collecting instinct, ownership, fetishism, and boy life in a Massachusetts town forty years ago.)

Henderson, C. H. *Education and the Larger Life.* Houghton, Mifflin, 1902, 386 pp.

Key, Ellen. *Century of the Child.* Putnam, 1909, 339 pp.

King, Irving. *Psychology of Child Development.* U. of Chicago Press, 1903, 265 pp.

Kirkpatrick, E. A. *Genetic Psychology.* Macmillan, 1909, 373 pp. (Emphasizes the instinctive basis of education.) Editor of Studies in Development and Learning. *Arch. of Psy.*, 1909, 101 pp. (Miscellaneous studies.)

Lay, W. A. *Experimentelle Didaktik.* 3d. ed. Leipzig, 1910, 661 pp. (Summarizes work on the various school subjects.)

McKeever, Wm. A. *Farm Boys and Girls.* Macmillan, 1912, 326 pp.

Macmillan, Margaret. *Early Childhood.* Swan, Lond., 1900, 211 pp. (Good.)

Mangold, Geo. B. *Child Problems.* Macmillan, 1910, 381 pp.

Meumann, Ernst. *Vorlesungen zur Einführung in die Experimentelle Pädagogik.* Enlarged and revised ed. Engelmann, Leipzig, 1911. (This is the great German reference book for practically all phases of child study.)

Monahan, A. *Rural Education in the United States.* Wash. Gov. Print., 1913, 72 pp.

Mumford, Edith. *The Dawn of Character.* Longmans, 1910, 225 pp. (Good, especially on the moral aspects.)

O'Shea, M. V. *Education as Adjustment.* Longmans, 1903, 317 pp.

Parmelee, Maurice. *Science of Human Behavior.* Macmillan, 1913, 445 pp. (Moral aspects especially.)

Partridge, Geo. E. *Genetic Philosophy of Education.* Sturgis and Walton, 1912, 401 pp. (An excellent epitome of G. Stanley Hall's educational writings, with a list of them.)

Pearson, E. L. *The Believing Years.* Macmillan, 1911, 303 pp.

Perez, B. *First Three Years of Childhood.* Bardeen, 1889, 294 pp. $1.50.

L'education dès le berceau. 1888, 320 pp.

L'enfant de trois à sept ans. 1888, 307 pp.

Plaisted, Laura L. *Early Education of Children.* Clarendon Press, 1909, 398 pp.

Pyle, W. H. *Educational Psychology.* Warwick and York, 1911, 254 pp.

Richmond, Ennis. *The Mind of a Child.* Longmans, 1901, 176 pp. $1.00.

Rusk, R. R. *Introduction to Experimental Education.* Longmans, 1912, 303 pp. (Contains much of material from Meumann.)

St. John, E. P. *Child Nature and Child Nurture.* Pilgrim Press, 1911, 106 pp. (Very simple.)

Schreiber, Adèle (ed.). *Das Buch vom Kinde.* Teubner, 1907, 2 vols. in 1. (An important résumé of work in child study.)

Schulze, Rudolph. *Aus de Werkstatt der Experimentelle Psychologie.* Leipzig, 1909, 292 pp. (Eng. trans. by R. Pintner,

Experimental Psychology and Pedagogy. Macmillan, 1912, 364 pp.)

Sisson, E. O. *Essentials of Character.* Macmillan, 1910, 209 pp.

Starch, D. *Experiments in Educational Psychology.* Macmillan, 1911, 183 pp.

Sully, James. *Studies of Childhood.* Appleton, 1900, 525 pp. $2.50. (An excellent discussion of child nature.)

Swift, Edgar J. *Mind in the Making.* Scribner's, 1908, 329 pp. *Youth and the Race.* Scribner's, 1912, 342 pp. (Good presentations from the genetic standpoint.)

Thorndike, E. L. *Educational Psychology.* Vol. I, The Original Nature of Man. Teacher's Coll., Columbia U. Pub., 1913, 318 pp. (An attempt to list and to describe the unlearned tendencies of man.)

Tracy, F. *Psychology of Childhood.* Heath, 7th rev. ed., 1909, 219 pp. $1.20.

Urwick, W. E. *The Child's Mind, its Growth and Training.* Lond., 1907, 269 pp.

Washburne, Marion F. *Study of Child Life.* Am. School Home Economics, Chicago, 1907, 183 pp. (Deals especially with the baby. Simple and practical.)

Studies of Individual Children

Ament, Wilhelm. *Die Entwicklung vom Sprechen und Denken beim Kinde.* Leipzig, 1899, 213 pp.

Buchner, M. *Entwicklung der Gemutsbewegungen im ersten Lebensjahre.* Langensalza, Beyer, 1909, 19 pp.

Chamberlain, A. F. and Isabel. Studies of a Child. *Ped. Sem.*, 1904, 1905, and Mar. 1909.

Cramaussel, Ed. *Le premier éveil intellectuel de l'enfant.* 2d ed. Alcan, Paris, 1910, 200 pp.

Darwin, Charles. Biographical Sketch of an Infant. *Mind*, 1877, 285-294.

Dearborn, G. W. N. *Moto-Sensory Development.* Balt., •1910, 215 pp. (Good.)

Egger, A. E. *Sur le développement de l'intelligence et du langage.* Picard, 1887, 102 pp.

Espinas, A. Obs. sur un nouveau-né. *Ann. de la Fac. des Lettres de Bordeaux*, 1883.

Groszmann, M. P. E. *Study of Individual Children.* 1912, 76 pp.

Hall, Mrs. Winfield S. First Five Hundred Days of a Child's Life. *C. S. M.*, Vol. II, 1897. (Accurate, brief record.)

Hogan, Louise. *Study of a Child.* Harper, 1898, 219 pp.

Löbisch, J. E. *Entwicklungsgeschichte der Seele des Kindes.* 1851.

Major, David R. *First Steps in Mental Growth.* Macmillan, N. Y., 1906, 360 pp.

Moore, Kathleen Carter. Mental Development of a Child. *Psy. Rev.*, Monog. Sup. No. 3, 1896. (Excellent.)

Partridge, Geo. E. *Outline of Individual Development.* Sturgis and Walton, 1911, 240 pp. (Suggestions for observation.)

Preyer, Wilhelm. *Development of the Intellect.* Appleton, 1898, 317 pp.

Senses and Will. Appleton, 1899, 346 pp.

The Infant Mind. Appleton, 1889, 317 pp.

(The first two books give the most detailed individual study that has yet been made, and have been the basis of all following ones. The last is a brief résumé of the others.)

Scupin, E. and Mrs. G. *Bubi's Erste Kindheit.* Grieben, Leipzig, 1907, 264 pp.

Bubi im 4 bis 7 Lebensjahre. Grieben, Leipzig, 1910, 272 pp.

Shinn, Milicent W. *Biography of a Baby.* Houghton, Mifflin, 1900, 247 pp. (A delightful study of the first year.)

Notes on the Development of a Child. University Press, Berkeley, 1907, 258 pp.

Sigismund, B. *Welt und Kind.* 1856, 221 pp. (One of the very early studies.)

Sikorsky, I. A. *Die Seele des Kindes.* Leipzig, 1902, 80 pp.

Tiedemann, D. *Record of Infant Life.* Bardeen, Syracuse, 1890, 46 pp. $0.15. (Study made in 1781, the oldest known.)

Tilley, Laura Sawin. *Record of the Development of Two Baby Boys.* Assn. Coll. Alumnæ Pub., 1910, 83 pp.

Talent and Genius

Adler, A. *Ueber Minderwertigkeit von Organe.* Urban, 1907, 92 pp.

Adler, A., and Fortmüller, K. *Heilen und Bilden.* Reinhardt, Munich, 1914, 186 pp.

Also articles in his magazine, *Zeits. für Individualpsychologie*, pub. in Munich, monthly, 1 mark.

Berle, A. A. *The School in the Home.* Moffat, Yard and Co., 1912, 200 pp.

Bruce, Addington. Bending the Twig. *Am. Mag.*, 1910, 690-695.
Lightning Calculators. *McClure's*, 1912, 586-596.
New Ideas in Child Training. *Am. Mag.*, 1911, 286-294.
Story of Karl Witte. *Outlook*, 1912, 211-218.
Burnham, W. H. Individual Differences in the Imagination of Children. *Ped. Sem.*, 1893, 204-225.
Davidson, H. A. The Gift of Genius. *Jour. of Ped.*, 1904, 281-297.
Dolbear, Katherine. Precocious Children. *Ped. Sem.*, Dec. 1912, 471-491. Bibliog.
Downes, F. E. Seven Years with Unusually Gifted Pupils. *Psy. Clinic*, 1912, 13-18.
Ellis, Havelock. *Study of British Genius.* Lond., 1904, 300 pp.
Galton, Francis. *English Men of Science.* Lond., 1874, 266 pp.
Groszmann, M. P. E. The Exceptionally Bright Child. *Proc. Nat. Assn. for Study and Ed. Excep. Ch.*, 1910, 103-133.
Hirsch, W. *Genius and Degeneration.* Appleton, 1896, 330 pp.
James, Wm. The Powers of Man. *Am. Mag.*, 1907, 57-65.
Lombroso, C. Determining of Genius. *Monist*, 1901, 49-64.
O'Shea, M. V. Misconceptions concerning Precocity in Children. *Science*, 1911, 666-674.
Scripture, E. W. Arithmetical Prodigies. *Am. Jour. Psy.*, 1891, 1-59.
Shields, T. E. *Making and Unmaking of a Dullard.* Cath. Ed. Press, Wash., 1909, 296 pp.
Sidis, Boris. *Philistine and Genius.* Moffat, Yard and Co., 1911, 105 pp.
Stern, Wilhelm. *Die differentielle Psychologie.* Leipzig, 1911, 503 pp. Bibliog.
The Supernormal Child. *Jour. of Ed.*, 1911, 143-149, 181-190.
Terman, L. M. Study of Precocity and Prematurition. *Am. Jour. Psy.*, 1905, 145-183.
Genius and Stupidity. *Ped. Sem.*, 1906, 307-373.
Van Sickle, J. H. Gifted Pupils. *Jour. of Ed.*, 1910, 291-292; *Proc. N. E. A.*, 1908, 245-284; also, *Bull. Wash. Gov. Print.*, 1911, 92 pp.; *Ele. Sch. Teach.*, 1910, 357-366.
Whitby, C. J. *Makers of Man.* Lond., 1910, 410 pp.
Williams, T. A. Intellectual Precocity. *Ped. Sem.*, 1911, 85-103.
Yoder, A. H. Boyhood of Great Men. *Ped. Sem.*, 1898, 134-156.

VOCATIONAL GUIDANCE

Barrows, Alice. The Dangers and Possibilities of Vocational Guidance. *Ch. Labor Bull.*, Vol. I, No. 1, 1912, 46-55.

Bloomfield, Meyer. *Vocational Guidance of Youth.* Houghton, Mifflin, 1911, 120 pp. Bibliog.

Cooley, E. G. *Vocational Education in Europe.* Chicago, 1912, 347 pp.

Gillette, John M. *Vocational Education.* Am. Book Co., 1910, 303 pp.

Hutchinson, T. H. Vocational Guidance. Series of articles. *Assn. Sem.*, 1912, and Jan. 1913.

Münsterberg, Hugo. *Vocation and Learning.* St. Louis, 1912, 289 pp.

Page, C. S. *Vocational Education.* Wash. Gov. Print., 1912, 134 pp.

Parsons, Frank. *Choosing a Vocation.* Houghton, Mifflin, 1909, 165 pp. Bibliog.

Puffer, J. Adams. *Vocational Guidance.* Rand McNally & Co., 1913, 294 pp.

Richardson, A. S. *Girl Who Earns Her Own Living.* Dodge, 1909, 283 pp.

Rollins, F. W. *What Can a Young Man Do?* Little, Brown, 1907, 339 pp.

Vocational Education. Ed. by C. A. Bennett, Peoria, Ill., Vol. I, 1912. Bimonthly.

Weeks, Ruth. *The People's School.* Houghton, Mifflin, 1912, 207 pp.

Bibliography pub. by Brooklyn Public Library, 1913, 63 pp.

SPECIAL STUDIES OF INSTINCTIVE TENDENCIES AND INTEREST

Acher, R. A. Spontaneous Constructions and Primitive Activities of Children. *Am. Jour. Psy.*, 1910, 114-150.

Allin, A. Social Recapitulation. *Ed. Rev.*, 1899, 344-352.

Arnett, L. D. Origin and Development of Home and Love of Home. *Ped. Sem.*, 1902, 324-365.

Arnold, Felix. Psychology of Interest. *Psy. Rev.*, 1906, 221-238, 291-315.

Baldwin, J. Mark. Genesis of Social Interests. *Monist*, 1897, 340-357.

Social and Ethical Interpretations. *See* Index.

Balliet, T. M. Instincts and Education. *Am. Phys. Ed. Rev.*, 1908, 1-7.

Bligh, Stanley M. *Direction of Desire.* Lond., 1910, 360 pp.

Bodin, John E. Mind as Instinct. *Psy. Rev.*, 1906, 121-139.

Bolton, F. E. Hydro-psychoses. *Am. Jour. Psy.*, Vol. X, 171-229.
Bucke, W. F. Oliver, the Tame Crow. *Ped. Sem.*, 1903, Vol. X, 13-26.
Cyno-psychoses. *Ped. Sem.*, 1903, 459-573.
Burbank, Luther. *Training of the Human Plant.* Century Co., 1907, 99 pp.
Burk, C. F. Collecting Instinct. *Ped. Sem.*, 1900, 179-207.
Burk, F. and C. Frear. *Study of Kindergarten Problem in . . . Santa Barbara, Cal.*, 1898-99. $0.50.
Burnham, W. H. Group as Stimulus to Mental Activity. *Science*, N. S., 1910, 761-767.
Attention and Interest. *Am. Jour. Psy.*, 1903, Vol. XIX, 14-18.
Education from Genetic Point of View. *Ele. Sch. Teach.*, 1905, 117-124.
Chamberlain, A. F. Use of Plants by Children. *Jour. Am. Folk Lore*, 1901, Vol. XIV, 132-138.
Chancellor, W. E. *Motives, Ideals and Values in Education.* Houghton, Mifflin, 1907, 534 pp.
Davis, Benj. M. *Agricultural Education in the Public Schools.* U. of Chicago Press, 1912, 159 pp. Bibliog. (The most complete survey.)
Dawson, G. E. Levels of Development. *Jour. of Ped.*, 1905, 9-24.
Children's Interest in the Bible. *Ped. Sem.*, 1900, 151-178.
Psychic Rudiments and Morality. *Am. Jour. Psy.*, Vol. XI, 181-224.
Dewey, John. Interest as related to Will, second supplement to *Herbartian Year Book*, 1899.
Child and the Curriculum. U. of Chicago Press, 1902, 40 pp.
Educational Situation. U. of Chicago Press, 1902, 104 pp.
Ethical Principles Underlying Education. U. of Chicago Press, 1903, 34 pp.
Psychology and Social Practise. U. of Chicago Press, 1901, 42 pp.
School and Society. U. of Chicago Press, 1899, 125 pp.
Dexter, E. G. *Weather Influences.* Macmillan, 1904, 277 pp. Bibliog.
Dopp, Katherine E. *Place of Industries in Elementary Education.* U. of Chicago Press, 1903, 208 pp.
Ellis, G. H. Fetichism in Children. *Ped. Sem.*, June 1902, 205-220.
Ellis, Horace. First Lesson in Thrift. *Psy. Clinic*, 1910, 23-25.
Fitch, I. G. *Educational Aims and Methods.* Macmillan, 1900, 448 pp.

Greene, Louise M. *Among School Gardens.* Charities Pub. Com., 1910, 335 pp. Bibliog. (Good.)

Guillet, Cephas. Recapitulation and Education. *Ped. Sem.*, 1900, 397-445.

Study in Interests. *Ped. Sem.*, 1907, 322-328, 474-487.

Hall, G. Stanley. *See* books above referred to, in Index.

and Browne, C. A. Children's Ideas of Fire, Heat, Frost, and Cold. *Ped. Sem.*, 1903, Vol. X, 27-85.

The Cat and the Child. *Ped. Sem.*, 1904, 3-29.

and T. L. Smith. Curiosity and Interest. *Ped. Sem.*, 1903, 315-358.

Showing Off and Bashfulness. *Ped. Sem.*, 1903, 159-199.

Reactions to Light and Darkness. *Am. Jour. Psy.*, 1903, 21-83.

and Wallin, J. E. W. How Children Think and Feel about Clouds. *Ped. Sem.*, 1902, 460-504.

Harper, J. W. *Education and Social Life.* Pitman, Lond., 1907, 314 pp.

Harris, W. T. *Psychologic Foundations of Education.* Appleton, 1907, 400 pp.

Hart, W. R., and Morton, O. A. *Boys' and Girls' Clubs.* Wright and Potter, Boston, 1914, 32 pp. (Agricultural work.)

Jewell, J. J. *Agricultural Education, including Nature Study and School Gardens.* Wash. Gov. Print., 1908, 148 pp. (Very inclusive.)

Kaylor, M. A. Children and Pets. *Ped. Sem.*, 1909, 205-239.

Kent, E. B. *Constructive Interests of Children.* Columbia Univ. Pub., 1903, 78 pp. (Very suggestive.)

Kern, O. J. *Among Country Schools.* Ginn, 1906, 366 pp. $1.35. (Good.)

Kline, L. W. Truancy as related to the Migrating Instinct. *Ped. Sem.*, Vol. V, 381-420.

Miller, Persis K. School Gardens in relation to the Three R's. *Education*, 1905, 531-542.

Murdock, F. F. Children in Geography. *Jour. of Ed.*, 1906. Series of articles.

Ordahl, Geo. Rivalry. *Ped. Sem.*, 1908, Vol. 15, 492-549.

Ostermann, W. *Interest in Relation to Pedagogy.* Kellogg. $1.00.

Phillips, D. E. The Teaching Instinct. *Ped. Sem.*, 1899, 188-255.

Pillsbury, W. B. *Attention.* Macmillan, 1908, 342 pp.

Rooper, T. G. *The Child, his Studies and Occupations.* Kellogg. $0.50.

Ruediger, W. C. *Principles of Education.* Houghton, Mifflin, 1910, 305 pp.

Scyz, Angelina. Flowers. *Ped. Sem.*, 1906, Vol. XIII, 502-508.

Shuler, E. W. Passing of the Recapitulation Theory. *Ed. Rev.*, No. 44, 1912, 191-196.

Slaughter, J. W. Moon in Childhood and Folklore. *Am. Jour. Psy.*, Apr. 1902, 294-318.

Stockton, M. I. Preferences by Boys and Girls. *Psy. Rev.*, 1911, 347-373.

Thayer, Alice. Children's Interest in Flowers. *Ped. Sem.*, 1905, 107-140.

Thomas, I. W. The Gaming Instinct. *Am. Jour. Soc.*, 1901, Vol. VI, 750-763.

Titchener, E. B. Feeling and Attention. Macmillan, 1908, 391 pp.

Triplett, Norman. Pacemaking and Competition. *Am. Jour. Psy.*, 1898, Vol. VII, 507-533.

For experimental articles on attention and interest, *see* the annual bibliography published by the *Psychological Review*, and for supplementary references along the above lines, the lists at the end of each chapter in this book.

Among the numerous magazines devoted to child study, the following are among the best in English:

The Pedagogical Seminary. Ed. by G. Stanley Hall and W. H. Burnham. Clark University, Worcester. Quarterly. $5.00 per annum. (This is the oldest magazine devoted to child study and contains numerous original studies, besides many book reviews and notices. One of the valuable characteristics is the fullness of the bibliographies.)

The Child. Ed. by T. N. Kelynack. London. Monthly. $5.25. (This is excellent, especially on the side of hygiene.)

Journal of Educational Psychology. Warwick and York, Baltimore. Monthly. $1.50. (Also excellent, on the experimental side of education.)

Journal of Experimental Pedagogy. Ed. by J. A. Green. Longmans, London, 1s. per number. (Also on the experimental side of education. Contains very important articles.)

CHAPTER VII

Sensation and Perception

TEACHERS and students who are doing systematic work in child study should observe the following:

1. *Sight.* Keep a record of these points in the baby's seeing: **Observations**

(1) When was the blank stare replaced by real seeing of an object, that is, by convergence of the eyes upon the object?

(2) When did his eyes first follow a moving object? Was the object bright or large? Did he move head as well as eyes?

(3) When did he first look for an object or try to see where a sound came from?

(4) When did he first look for something that he had dropped?

(5) When did he first show a liking for some color? What was the color? Was it in a bright light?

(6) When did he first wink at the approach of some object threatening his eyes?

2. *Grasping.* When did these acts first occur?

(1) Closing of fingers over object put into the palm.

(2) Opposition of thumb and fingers in grasping.

(3) Putting hand in mouth.

(4) When did he first grasp for some object he saw?

Notice whether he reached for objects far beyond his grasp, that is, whether the hand closed to grasp them. Babies often stretch out their arms for things that they want—such as the moon—but Baldwin claims that in

such cases there is no reaching and grasping as there is when they expect to seize a tangible object. He also claims that a baby does not grasp at objects far beyond his reach, and very soon learns to correct his first slight inaccuracies in judging distances.

Teachers who wish statistics as to the ideas that children have about objects, should get G. Stanley Hall's pamphlet, *Contents of Children's Minds on Entering School*, also contained in *Aspects of Child Life*, and follow the plan outlined there. They may find another list of words more useful, but the general plan will be valuable in any case.

Introduction

In the preceding chapters we have discussed the physical nature of the child, and have hinted at some of the relations between it and education. We shall now take up his psychical nature and endeavor to trace the growth from the rudiments in sensation and perception to the more complex manifestations in the adolescent's reasoning. Each mental process, such as memory and imagination, will be similarly treated, so that when the account is finished we shall have an accurate picture of the mental growth of children.

In this part of our subject, far more than in the description of his physical nature or of his expressions of thought, observations are lacking entirely, or are few in number, or defective; but nevertheless, individual observation may still be supplemented to a considerable degree.

Prenatal consciousness

At what point in prenatal life feelings and sensations appear can never be settled until there is some general agreement as to the basis on which we can properly infer the presence of psychical processes. There is no such agreement at present, and

so we will simply state certain known facts, and our own conclusions.

The *Anlage*, or first differentiation of nervous tissue from other tissues, comes very early in embryonic life, between the twelfth and twentieth days, and the most striking characteristic of the human embryo all through its development is the large size of the brain as compared with the rest of the body. At the stage above mentioned it comprises about one half of the nervous system, and its apparent reduction in the course of development is due to the fact that it folds over upon itself to make the very complex arrangement of the developed brain. By the fifth month of embryonic life it is believed that the number of nerve cells is complete, and the later development both before and after birth consists in an increase in size of the cells, the formation of the myelin sheath about the fibers, and the growth of association fibers between the various parts of the brain.

If then we have a right to assume that any living organism with a nervous system has some sort of vague, rudimentary consciousness, we must grant it to the developing embryo at least from the third week on, but it is very difficult for us to understand what it would be like, so diffused and vague must it be. Again, it is known that there are at least slight movements as early as the fifth or sixth week, and in all probability these are the response to touch stimuli or to chemical alterations in the blood.

With regard to the special senses—touch, smell, taste, sight, and hearing—their organs are all sufficiently developed by the seventh month to function when stimulated, as has been abundantly proved in prematurely born children. That is, for at least two months before birth, all these parts of the

Senses before birth

nervous system have developed and have done so with few or none of their own proper stimuli. Undoubtedly there are touch stimuli and sensations for a considerable period before birth, as indicated above. Similarly, there are taste sensations obtained from the amniotic fluid which the child swallows, though they must be slight because this fluid has little taste. There can be no smell sensation, because the nasal cavities also are filled with this fluid. The ear also is filled with it, but very loud stimuli or jars may agitate it sufficiently to set the ear bones in motion and give a muffled sensation of sound. The eye can receive little or no light, and the only possibility of prenatal sensation here comes from pressure or changes in its circulation, or perhaps some body transparency to light, but these must be very slight. On the whole, the condition of prenatal consciousness is like sleep, with vague dreams and the responses to stimuli that occur in sleep, and perhaps now and then a brief awakening, concludes Preyer.

Senses at birth

The consciousness of the newborn child has been tested by various observers upon one or a few children, but by far the most important contribution is that of Peterson and Rainey on 1,060 newborn children in Bellevue Hospital (959 normal white; 35 colored; 41 premature; 13 pairs of twins). Forty-one of their cases were prematurely born, but even in those born in the seventh lunar month the nerves of special sense usually reacted like those of children born at full term. They summarize their observations in a preliminary way as follows:

"1. *Sight.* Sensibility to sight is present in most infants at birth, and this is the case even when prematurely born.

"2. *Hearing.* Sensibility to sound is quite as apparent

as sensibility to light at birth, for 276 normal children reacted to sound on the first day of life and 146 reacted to light. A similar condition existed among the premature infants, many reacting to sound on the first day, as well as to light. The auditory nerve is ready prepared to receive impressions of sound some time before the period of normal birth. This is wholly contrary to the opinions of other authorities.

"3. *Taste.* The gustatory nerve not only reacts differently to salt, sweet, bitter, and sour at birth, but the same mimetic reactions are observed in premature infants. This nerve is therefore ready to receive taste impressions some time before the normal period of birth.

"4. *Smell.* Two hundred and seven normal children reacted to odors on the first day of birth, and similar reactions were observed in premature infants.

"5. *Cutaneous sensibility.* Reactions to touch and temperature, and effective manifestations of discomfort obtained the first day in large numbers of normal infants, were similarly obtained in premature infants, showing that such sensibility is already present before the expiration of the period of normal gestation. There is every reason to believe that sensitiveness to painful stimuli is present, but the reactions are more vague and uncertain than in later life, which leads many to assume that the sense of pain is dull in the newborn. Muscular sense cannot be tested in infants, but there is every reason to believe that muscular sense, the sense of motion and sense of position, are developed early *in utero.*

"6. *Thirst-hunger and organic sensation.* The newborn child frequently reacts to thirst-hunger on the first day, though the actual need of food is seldom apparent until after the first or second day. Discomfort is clearly marked when nourishment is not forthcoming. The

cries of discomfort and pain are marked on the first day in full-term infants and noteworthy in the premature.

"7. *The beginning of memory, feeling, and consciousness in the newborn child.* There are good grounds for believing that the newborn child comes into the world with a small store of experiences and associated feelings and shadowy consciousness. The fact that even in premature infants we find the senses already prepared for the reception of impressions on the five senses is some evidence of such impressions having been already received and stored up in the dim storehouse of a memory already begun. It may even be that some sort of vague light impressions have been received, for it is possible that in the interior of the body the alternation of day and night may in a mild degree be manifested. The translumination of the hands before a candle, of the skull and face bones in examination of the frontal sinuses and antrum by electric lights, are evidences of a certain amount of translucency of the whole organism to sunlight, which is so much more powerful than any artificial light. There is greater possibility in the matter of the auditory sense that it may be stimulated by sounds within the body of the mother (by bone conduction possibly), such sounds as the beat of the maternal and fetal hearts, the uterine and funic souffles, and the bruit of the maternal aorta.

Consciousness at birth

"Moderate stimulation of the gustatory nerve is thought to occur through the common swallowing of amniotic fluid by the fetus.

"A marked development of the senses of touch and of muscular sense during uterine life is undisputed. . . . This activity of the muscles and constant contact of various parts of the fetal body within the uterine walls for a period of months before birth must lay a foundation

under the threshold of consciousness for a sense of equilibrium and vague spatial relations. The material basis of consciousness is prepared long before birth.

"There is already a feeling tone associated with the earliest reactions, though we are altogether in the dark as regards its psycho-physiology. The process has been thus formulated: Stimulus-reaction-liking-reinforcement. Stimulus-reaction-dislike or pain-inhibition. This is the early simple associative memory in reactions to stimuli.

"8. There are no perceptible differences in reactions of colored and white children or between pairs of twins."

Comparing these observations with those of other observers, we find a general agreement but also some important differences, more especially with regard to hearing. The hearing test was given with a rattle of such a character that the authors are convinced there could be no mere jar or vibration from it to stimulate the child, and yet with forty-eight normal children, twenty-three reacted to it within the first three hours after birth, sixteen within the first two, eleven within the first, two within forty-five minutes, one within thirty minutes, and one within fifteen minutes after birth. Most earlier observers, especially Miss Shinn, make more or less positive assertions as to deafness during the first two or three days, but it is interesting to note that Preyer is very careful not to do so, and in his *Physiologie des Embryo* states that the ear is ready to function for some time before birth and probably does receive muffled stimuli to which it reacts. We might make the general statement here that when an organ in any part of the body is found all ready to function it is difficult for the biologist to understand this readiness without some previous functioning, however imperfect. The prevalent standpoint to-day is that the development of the embryo

and of each organ is a matter of reaction to stimuli.

Therefore we must not look upon the newborn child as an utter stranger to this our world. The little world within from which he comes has already given him in a vague, dim form all the classes of sensations which he will receive in the large outer world. Touch and the muscular sense especially have been exercised so that at birth, if not before, there is some localization of touch stimuli and, Kussmaul believes, some consciousness of an outer something which can satisfy hunger and thirst by going to the mouth. Organic memory has begun, and we may at least ask why it is not possible that there should be memory images of touch and movement, and perhaps of taste, though in this case the stimuli are slight.

If we attempt to picture the mental condition involved here, we may quote Miss Shinn, with certain omissions: "She took in with a vague comfort the gentle light that fell on her eyes, seeing without any sort of attention or comprehension the moving blurs of darkness that varied it. She felt motions and changes; she felt the action of her own muscles, and . . . disagreeable shocks of sound now and then broke through the silence or perhaps through an unnoticed jumble of faint noises. She felt touches on her body from time to time . . . and steady, slight sensations of touch from her clothes, from arms that held her, from cushions on which she lay, poured in on her.

"From time to time sensations of hunger and thirst, and once or twice of pain, made themselves felt through all the others, and mounted till they became distressing; from time to time a feeling of heightened comfort flowed over her as hunger or thirst were satisfied; or release from clothes and the effect of the bath and rubbing on her circulation increased the net sense of well-being. . . .

For the rest she lay empty minded, neither consciously comfortable nor uncomfortable, yet on the whole pervaded with a dull sense of well-being. Of the people about her, of her mother's face, of her own existence, of desire or fear, she knew nothing. Yet this dim dream was flecked all through with the beginnings of later comparison and choice."

To trace the steps of the marvelous transformation from this animal-like little being to the wide-awake, fascinating little person of a year later is especially to trace the development of sensation and perception. Memory, imagination, and thought also begin here, but do not develop so rapidly as does perception.

After birth the ordinary stimuli and the reactions to them cultivate a certain amount of discrimination, but this is as a rule much less than is possible and less than the nascent senses demand. Let us briefly consider the development of sensation and perception in babyhood and childhood.

Development of smell

It is difficult to test the sense of smell with any accuracy, and this sense is also of lessening importance in human life, although of great significance for some animals. Few observations have been made upon it in children. Undoubtedly it is developed at birth, but children seem rather insensitive to it on the whole, and if kept in cleanly surroundings, with good air, have relatively little opportunity to exercise it. At puberty it becomes more sensitive, a fondness for perfumes is likely to develop, and the odors connected with persons are more keenly perceived with pleasure or dislike. In some instances the sense is so keen that individuals are recognized by their odor, and this is especially likely to be the case if some other sense, such as sight or hearing, has been lost.

Aside from the æsthetic pleasures from perfumes, children should be taught to know the odors of practical importance—bad air, gas, odors that indicate whether food, especially meat, is edible or not, and so on.

Of taste

We have seen that for some time before birth the power to distinguish sour, bitter, and sweet tastes is present, and soon after birth Preyer found considerable fineness of discrimination. It is interesting to know that in babies and children the taste buds are more widely distributed than in adults, sometimes on the cheeks and in the back part of the nasal passages as well as on the tongue. In lower forms of life they are still more widely distributed, sometimes being scattered over the surface of the body, so that the animal not only tastes with its mouth but with its skin. The baby, as we all know, tends to put everything to its mouth, and this it does even when not hungry. In the little child, especially before the fourth or fifth year, this tendency to taste, lick, and suck everything is undiscriminating, including often even disgusting things. Bell gives a list of one hundred and eighty things thus experimented with. By degrees this catholicity narrows, but all through childhood, especially from seven to ten, he finds that most children like to try new mixtures and kinds of food, while at adolescence new tastes and likings develop but also strong dislikes, and the social factors in eating come far more to the front.

We cannot here discuss the matter of children's diet, but we must indicate certain guiding principles. It should not be necessary to say that the only way to give a child a normal, healthy liking for foods is to supply him from the beginning with the right kinds of food properly cooked. The child fed on fried, greasy, stimulating food of course adapts himself to it and acquires

the liking of custom even though it is ruining his digestion. Similarly, the child fed on the simple, well-cooked diet suited to his age likes it and will prefer it throughout life, as the other child does the unhealthful food. But again, since the normal child likes to make these taste experiments, he should have a chance to do so. An effort should be made to put on the home table new kinds and new combinations of food, such as the dishes characteristic of various nationalities or feasts and festivals. Variety and change are great aids to appetite. On the other hand, to cater to caprice is as great a mistake as to ignore individual tastes entirely. To cook individual dishes for the various healthy children in a family is folly, just as is the opposite extreme of forcing a child to eat food for which he has an insurmountable dislike. Of course, a child may have some digestive, nervous, or other disturbance which necessitates a special diet, but if he is well, he should eat the family dishes or go hungry. Many of the caprices of children's—not adolescents'— appetite, are simply those of an overfed animal.

Of sound

The sensitiveness to sounds varies considerably. Compayré records that about the fourth day such slight sounds as a sneeze or a whistle caused violent responses. We should notice, however, that a child's starts or tremors when a door slams or when a loud voice speaks are often due to the jar instead of to the noise. This can easily be tested by making the sounds where none of the jar from them can reach the baby. Mrs. Hall observes this great sensitiveness to jars on the first day.

On the seventh day a loud call would not awaken Preyer's son, but on the third day Miss Shinn's niece started when some paper was torn at a distance of eight

feet. By the fifth week, Preyer's boy was so sensitive that during the day he would not sleep if any one was talking or walking in the room. On the other hand, many babies sleep tranquilly through prolonged conversations. Habit has much to do with this.

In the eighth week this same boy heard the piano, and was much pleased with the loud tones, but paid no attention to the soft ones. The various observations on sensibility to musical tones we shall consider later in connection with music.

During teething, the same boy's sensibility to sounds was increased, and after the first year most new sounds, even when very loud, like thunder, caused pleasure instead of fear.

Mrs. Hall noticed that her child distinguished different kinds of sounds before any one sound was recognized. When we consider the adult's inability to recognize absolute pitch, this is just what we should expect. Our knowledge and recognition of sounds are almost entirely matters of their relations to each other.

Five minutes after birth, when taken to a window in the twilight, Preyer's son showed some sensitiveness to the light. The eyes of a baby will close if a bright light is brought near them, and are partly closed most of the time at first. Compayré thinks that one reason why some babies are so wakeful at night is that the darkness does not fatigue their eyes as daylight does.

Of sight.
1. Sensitiveness to light

This first shrinking soon disappears, however. Within a few days the baby will turn its head toward a window or light, and within a few weeks will give various expressions of pleasure at light. The strabismus or squinting which is so marked in most newborn babies disappears by the third week, and moderately bright lights

are enjoyed. The great sensitiveness to light at first is shown also by the fact that a baby's pupils are more contracted than an adult's.

The importance of shielding a baby's eyes from a glare of light is thus evident. A little baby should not lie facing a window or bright light for any length of time, any more than a child should be allowed to face them when he reads.

2. Range of vision

Observation seems to show that babies are generally shortsighted for a time, and in addition to this, their inability at first to move their eyeballs or head with any regularity limits their vision still more. The lens also does not accommodate itself to objects at first, so that any object outside of the one focal distance must be very indistinct. While a child is not born blind, therefore, his visual world is limited to the few feet directly in front of him, filled with indistinct blurs. By the sixth week the shortsightedness is less marked and by the eighth, accommodation of the lenses begins, both greatly enlarging the child's world.

3. Movements of eyes; the eyelids

The first movements of the eyelids are not coördinated either with each other or with the eyeballs. One eye may be wide open when the other is half shut, and both will sometimes close while the eyes are fixed on some object. At first also they seem to be less sensitive than later, for wetting the eyelids and even the cornea, which is so sensitive in adults, will not cause the eyelids to close in some cases until after the third month. So also at first there is no winking when an object threatens the eyes. The first appearance of winking occurs some time between the forty-third and sixtieth days, by which time the movements of the eyelids are fairly well co-ordinated.

Convergence, that is, harmonious movements of the eyeballs so as to bring the points of clearest vision in both to focus upon the same object, is in as imperfect a state at birth as is everything else. Many children are born cross-eyed and remain so for months, the defect disappearing as the eyes are used and accustomed to work together.

The eyeballs

In all children different degrees of incoördination can be observed even from the very first, for while at some times the eyes are evidently not working together, at others they appear to be. In the latter case, however, closer watching usually shows that the movements are not perfectly coördinated. Compayré traces the development from incoördinate movements to involuntary coördinated, and then to voluntary coördinated; but while this shows the logical order and the order in which the relative importance of the movements progresses, all three are found from the second week on, if Preyer's observations are correct. He notes that on the seventh day his boy's eyes followed a candle, and converged, while on the eleventh day there was unmistakable fixation of the eyes. Mrs. Hall also notes that from the second week the eyes began to rest on objects, but places the first unmistakable fixation on the twenty-first day. On the fifty-third day her child gazed at a box of rattling matches for six minutes, and on the sixty-second at a purse of jingling coins for twenty-eight minutes. Even then he would have continued, though showing great fatigue.

This prolonged convergence of the eyes is one of the very important steps in seeing, as until it is accomplished there can be no definite marking out of one object from another. Sully notes that convergence is well established by the sixth week, and it is followed almost at once in

the eighth week by the accommodation of the lenses, which makes each object still more distinct and definite in outline. The first well-defined seeing of objects probably occurs therefore about the second month, or between the second and third months.

Following a movement with the eyes cannot occur until convergence is well established, but we find that Preyer notes the first following with the first convergence, on the seventh day. He notes again, however, on the twenty-third day, that his son followed a moving candle with his eyes and turned his head to do so. On the thirtieth day Mrs. Hall's child followed the movements of a brush and comb, and on the thirty-eighth day, that of a gently swinging ball. This ability remains limited for a long time; thus we find Preyer's child from the forty-third to the sixty-fourth weeks just learning to look after an object that falls, and even when two and one-half years old unable to follow the flight of a bird.

Looking for a hidden object

After the baby gets distinct retinal images of objects through convergence and accommodation, and has learned to follow a moving object with his eyes, but one small step is necessary before his mental growth proceeds by leaps and bounds; that is, he must learn to look for an object that is out of sight. Herein lies the germ of memory and a clear manifestation of will.

Miss Shinn first observed this at the beginning of the eighth week, when the baby turned from studying her aunt's face to study her mother's, which was entirely out of sight. Accommodation began at the same time, and was succeeded by a period of absorbed looking at everything that she could by any possibility twist her head and body to see.

Closely connected with this, from the eighth to the

twelfth week, is the first recognition of faces. Naturally, the one who takes the most care of the baby is noticed first, or, if several persons spend about the same time with him, the one who most satisfies his instincts and impulses. Before this, even as early as the third week, a baby learns to recognize people by touch, but here we are speaking of sight alone.

Finally, we come to the sense of touch, the mother sense, the oldest, both in the history of the race and of the individual, from which all of the others have been developed, and to which we still return to get the closest sense of reality and the best proof of the existence of things. Not only is touch the oldest, but it is also the most widely distributed, sense. From the skin, with its various nerve endings sensitive to pressure, temperature, and pain, a million and a half or more of nerve fibers pass to the spinal cord. Other touch organs end in the muscles, joints, and tendons, and still others in the visceral organs. We cannot even begin to describe these adequately. We can only roughly indicate certain general facts important to those dealing with children.

Touch

Here, as in the case of smell, we have no exact observations as to how much a baby discriminates differences of heat and cold. It seems probable that at the first bath he feels warmth and cold, and after the first week he shows decided pleasure in a warm bath and dislike of one 1½° C. lower.

1. Temperature

Taylor warns us that the child of two or three years has a membrane so much more sensitive than an adult's that it may be blistered by food which to an adult seems only warm. He evidences the protests of children against food and water which to us seem only agreeably heated.

Under the head of passive touch we consider only those pressure sensations in which the skin alone is involved. When the muscles also are used, as in exploring a surface or in grasping, we have active touch. When respiration begins, the reflexes called out by slapping or pinching are stronger than before, and after two or three weeks there is a markedly stronger response to a slight stimulus than at first.

2. Passive touch

Preyer found that the lips and tongue of a newborn child are the most sensitive parts of the body. Tickling the tip of the tongue before the child had ever been fed caused sucking and swallowing movements, while tickling the root caused movements of ejection.

Touching the palm of a two hours' old child causes the fingers to close about the object, and the grasp is so strong that the babe may hang suspended by his hands for half a minute—a feat many adults cannot duplicate. Touching the soles also causes reflex movements, but they are slower than a week or so later.

In the discussion of this subject we anticipate what should come in the chapter on instincts, but it is so essential to the understanding of perception that the separation is unavoidable. We shall take up here the series of movements which most assist the child in getting a knowledge of objects as distinct from each other and as holding space relations to each other.

3. Active touch

We have already seen that Preyer found that the lips and tongue are most sensitive in passive touch, and we all know that everything goes into a baby's mouth, there to be sucked and licked. Preyer attributes this to the baby's belief that all the world is milk, and that to get milk at any time all that is necessary is to put the first handy object into his mouth and suck it diligently. Miss Shinn takes issue

Mouthing

with Preyer here, and maintains that things go into the mouth on account of the pleasure that comes from contact with the sensitive lips and tongue, just as an adult gets pleasure from touching smooth, warm surfaces or from exploring the outlines of an object with the hand. Both theories are based on observations of only a few children, but Miss Shinn's seems more true than Herr Preyer's. We must, of course, except from consideration the hungry child. He wants only food. But when he is fed and warm and happy, he will still mouth eagerly at anything between his lips, and will continue to do so even though it is hard and tasteless. He shows no disappointment when no milk comes from it, but on the contrary goes over it again and again with lips and tongue. And his repeated experiences that milk flows only from the bottle do not deter him. On the contrary, long after a baby has shown in other ways that he associates definite experiences with definite objects, he continues to put things into his mouth. He would not do this if all that he wanted from them were food.

Miss Shinn also observed in her niece a stage when, to some extent, she used the mouth for grasping instead of the hand, putting her head down, like a dog, to get at the object, and protruding her lips. For some time, in getting an object into her mouth from her hand, she pushed her head down toward her hand more than she raised her hand to her mouth. For some time she would mouth over the face and dress of the person holding her, in preference to using her hands.

Even children four or five years old put things into their mouths to suck, although they know that they are not eatable, and many adults do the same. The habit of chewing gum, where there is no taste after the first few minutes, illustrates this.

In all this, there seem to be traces of the survival of an ancestral stage when man, like other animals, did not use his hands for grasping, but only his mouth. The stage is, of course, rudimentary, and is not distinctly marked off from that of hand grasping, but it does seem to be present.

Hand grasping

For lack of a better name, we call the first movements of a child's hands and arms random. Many of them are not coördinated and they seem to serve no useful end. The child himself has no control over them. They are due to overflows of nervous energy, which drain off in this way.

In the first random movements the arms go helplessly here and there, striking against the surrounding objects, against the baby's own body, his face and his eyes, and now and then getting into his mouth, where they are sucked. They are especially likely to get to his mouth, because in the prenatal posture the hands are close to the mouth, and the position is naturally assumed by a baby for some time after birth. The great enjoyment obtained from the thumb or fist, deepens the connections thus accidentally formed between the hand movement and the sucking movements, so that he soon learns to put his hands to his mouth when he pleases. By the twelfth week Mrs. Hall's baby was able to put things into his mouth or near enough to it so that the lips could feel them and draw them in. Even in the forty-third week, Preyer's boy would miss his mouth sometimes when it was open and waiting for food. In first learning these movements, the left arm often moves symmetrically with the right.

Grasping develops slowly through a number of stages as follows:

1. Reflex clasping. Two hours after birth the fingers

will close over an object put into them, and within a few days a loud sound or bright light may cause a convulsive throwing up of both arms. Mrs. Hall states that at first her baby seemed unconscious of any object in his hand, but that on the fifty-seventh day the fingers closed over a small pencil case. It seems as if her observation must be defective here, as all other observers agree that the reflex grasping occurs shortly after birth.

Reflex clasping

2. Holding with the thumb opposed to the fingers when an object chances to be in the way of the moving hand. Mrs. Hall notes that after the seventieth day the thumb lay outside the fingers when the hand was closed, while before it had been inside. During the first three months, the thumb becomes opposed to the fingers as in an adult, so that any objects which come into contact with the hand are more firmly held. This fact, combined with the ability already gained to put the hands to the mouth, results in many objects being taken to the mouth, where the variety and pleasure of the new feelings prompt him to repeat the act.

Thumb and fingers

Thus the thumb and fingers have learned to work together, though awkwardly, and thus connections have been established between arm movements and the pleasures of sucking the hand or the objects held in the hand. But as yet the eye does not direct the hand, and therefore the child does not reach for objects that he sees, and he does not look at objects held by his hand.

In order to bring out vividly the importance of the sense of touch we cannot forbear the pleasure of quoting at length from Arnold and Beatrice Gesell's book on *The Normal Child and Primary Education* (pp. 110-113):

"When compared with sight and hearing, touch has been called an unintellectual sense, but such a statement is seriously misleading. The most fundamental data for our perception of distance, direction, size, and form come through the feel gate. Only handling and manual activity can put vividness and content into the perceptions of the outside world. The child must begin in very infancy its acquaintance with the resistance and construction qualities of paper, sand, cloth, wood, etc. . . . If his opportunities be good he will by tools learn the individuality of various woods, cardboard, leather, wire, fibers, clay, glass, stone, wood, cotton, and by dabbling acquire enough about every art to give him an appreciative apperception for everything that man has made. Our point is that he cannot get this appreciation by mere reading or listening or even observation. His skin and tendons and muscles must be stimulated before he gets the kernel of reality in any physical thing. For this reason much of the object teaching in the schools is not nearly so effective as is often fondly believed. It is only eye deep, and what children need is the opportunity to handle and stroke. A picture is better than a word, a stuffed bird is better than a picture, but nothing can take the place of putting a little live creature into the palms, where fifty thousand touch bulbs will tingle with the fluffiness of the feathers. . . . There were touch sensations in the primordial sea where the earliest life began. There were touch sensations in the mud and on the land billions of years before the continents took their present shape and before man appeared upon the face of those continents. Touch is most intimately associated with the fundamental instincts of workmanship, hunger, sex, curiosity, fighting, and sympathy. Moreover, it is most

Significance of touch

vague, diffuse, and general in character. All thes reasons combine to make it the most profoundly an massively emotional of all the senses, especially in chil hood. . . . Through no other avenue does the chil get such a wealth of artistic enjoyment. Who ca number the thrills of pleasure every eager child gains b the mere stroking of smooth surfaces and rondure polished woods and marbles, pebbles, silks, vegetable fruits, animals? And what of the endless rapturou experiments with the textures, the pliancy, elasticity, an rigidity of all sorts of materials?

"Then there are the larger dermal joys and adventure in which face and cheek and sometimes the whole bod participate—the big, tactual experiences with the el ments, fire, frost, cold, wind, mist, sod, beach, and se These massy experiences, though less discriminative tha the delicate touches of the finger tips, are all the mor bucolic and exuberant, for they are profoundly dye with the interests, joys, and longings of the race; an there is a resurgence of feeling when the child reëxper ences them. Hence his orgy of enjoyment when he free to wade, wallow, and splash in mud or water. Bar headedness, barefootedness,—and on swimming an athletic days barebodiedness—are the biological righ of every child. Only by such generous exposure to win and weather, to earth, water, and sky, can nature mak those rich, massive impressions which get to the depth the soul. Every child needs a rich range of touch e periences—of the delicate for the appreciation of thin refined, of the grosser for the appreciation of thin strong, stately, and sublime. . . . Everything, howev humble, which enriches the active and passive touc experiences of the child, will therefore contribute t higher æsthetic enjoyment."

So far, the development of each sense has been considered separately, as if when the baby saw, he did not also touch or hear or taste, while actually the different senses coöperate almost from the beginning, although imperfectly. Connections are established with particular rapidity between certain sensations and certain reactions. Within two or three weeks after birth, for instance, the sight or smell of the milk will call out a definite response from the baby.

Sensation and perception

Such a sensation has bound up with it certain other possible experiences that make it more than a mere sight or sound. The sight of the milk now means also to the baby a certain taste and satisfaction. Later on, the sight of his mother's face means being held and petted; the sight of his bath means splashing, and so on through all his various experiences. He is binding together thus the numerous different experiences that he gets from each sense and from different senses, and the result is that each sensation comes to stand for a great many more possible sensations that he can get if he chooses to exert himself to do so. When a sensation has thus acquired meaning, it has become a perception.

The first sensations that are associated are probably those of the taste and the touch of milk. These very soon become associated with the sight of the bottle, the connections being established even as early as the third week. A child will then push toward the bottle and a little later will cease fretting as soon as preparations for feeding him are begun.

Taste and touch

It is probably the case that various touch sensations are very early combined into one whole, as a baby distinguishes persons by the way they handle him long before he knows faces. But we have no careful observations on this point.

Touch and touch

Sully's *Extracts* record that in the sixth week the baby for the first time turned his head toward a sound to see what made it. Preyer did not see this until the eleventh week, but then it became very common and by the sixteenth week was done so quickly that it seemed reflex. This connection never becomes close. Adults are rarely able to locate sounds very accurately.

Sight and sound

We have already noted that between the eighth and twelfth weeks a baby first recognizes faces by sight and begins to seek for objects that are out of sight. He has now an immense amount of work before him in the way of connecting the various appearances of objects with each other and of tracing similarities between objects, and he proceeds to this work with infinite zest. If we will but consider a moment, we can see how complex a task this really is. The slightest change of position changes greatly the appearance of any object. A table is not at all the same thing to the baby on the floor that it is when he is in some one's arms, and both are different from the table that he sits up to in his chair. We grown people have learned to allow for these differences; but to the baby mind the visual world must present a series of metamorphoses far more startling than any that the fairy godmother is ever supposed to make. It is, then, small wonder that he believes in fairy tales two or three years later if the wonder created in his little mind by these first miracles leaves any lasting impression.

Sight and sight

Miss Shinn gives such an excellent description of what takes place in establishing these connections between the various appearances of an object that we will take it as typical: "Later the same day (when six months old) she sat in my lap watching with an intent

and puzzled face the back and side of her grandmother's head. Grandma turned and chirruped to her and the little one's jaw dropped and her eyebrows went up in an expression of blank surprise. Presently I began to swing her on my foot, and at every pause in the swinging she would sit gazing at the puzzling head till grandma turned or nodded and chirruped; then she would turn away satisfied and want more swinging. . . . At first, amazed to see the coil of silver hair and the curve of cheek turn into grandma's front face, the baby watched for the repetition of the miracle till it came to seem natural, and the two aspects were firmly knit together in her mind." Preyer tells also of how Axel in his seventh month gasped with astonishment when a fan was opened and shut before him. If we can imagine our own feelings if a table should suddenly begin to disappear and reappear, we can faintly understand his surprise.

When we consider that this same process of connecting the various aspects of objects has to be gone through with each object, we have a vastly increased respect for the working powers of the baby's brain!

Recognition of visual form grows rapidly, and by the seventh or eighth month we find some babies identifying pictures, or recognizing the real object from its representation, as with Mrs. Hall's child, who recognized a real dog from its likeness to a toy one that stood on the mantelpiece.

In all this the baby is getting his world of things seen well separated from each other and reunited into distinct wholes, but this process is much facilitated when he begins to connect sight and touch.

At first the two series seem to run side by side independently. The baby's hands grope and fumble with objects and learn to carry them to his mouth, but his

eyes do not follow his hands. The connection between the two is established mechanically at first. The eye chances to catch sight of the hand that is fumbling some object and follows its movements as it does those of any moving thing. Sometimes the empty hand catches the eye and is carefully studied. Thus, by degrees, the eye forms the habit of watching the hand as it seizes, and later of directing it.

Sight and touch

The time when active touch and seeing are thus first united is given very differently. Sully puts it as early as the ninth week; Mrs. Hall, the fourteenth; Preyer, the seventeenth; and Miss Shinn, the twenty-first. It seems doubtful whether it could occur as early as the ninth week, for then convergence and accommodation have only just been established, and the distinct seeing of objects would be too new a thing for the eye to control the hand with any success. More observations are needed on this point.

When the connection is once established, however, a baby is indefatigable in his efforts to reach and handle everything about him. Here we stumble upon the question whether a baby reaches for objects more than a few inches beyond his grasp, or whether he has an inherited distance sense, an instinct for distance. Baldwin, in a series of experiments on his child, found that she never grasped at objects more than a foot beyond her reach, and soon learned to correct this error. He argues, therefore, for a rudimentary instinct. Preyer brings forward on the other hand, numerous illustrations of Axel's grasping for objects across the room; and finally cites this incident, which occurred in the ninety-sixth week. Axel was in the garden and his father in a second-story window. Axel held up a piece of paper, asking his father to take it, and held it up to him

for some time, thinking that he could reach his father's hand.

The various observers record numberless attempts and failures to grasp, but whether the failure is due to wrong judgment of the distance or simply to lack of control of the hand is not evident from the accounts. As between Baldwin and Preyer, it is impossible to form an opinion until we have more extended data. Observations on one child are not sufficient material for a theory, especially when there is so much dispute, as in this case.

The ability to direct the hand by the eye increases very rapidly when once begun, until the child of a year has fair control of the larger movements; but how much he lacks in detail is shown by his difficulty in doing many common things. He has to learn to carry a spoon straight to his mouth, to dress himself, to button or lace his shoes, to throw a ball — in short, to do all the acts that with us are so habitual that we are almost unconscious of them.

In these numberless ways he is getting more and more definite ideas of the qualities of objects, and of their relations to each other in space — that is, ideas of distance. He now has but to continue repeating in detail what he has already gone over in large.

Senses and the mental life

When we consider perception in its larger aspect as knowledge and observation of the world about us, the part played by each of the senses and our own psychical reaction to the various stimuli become of great importance. Sanford points out that touch is especially closely connected with the muscles, and that it is the only sense that can be doubled upon itself, as it is when we get double contact. It also stands high in the power to rouse emotion. Hearing

also is very closely connected with the muscles, but as a long-range sense it becomes the basis of many indirect perceptions and inferences, especially in language. Seeing, of course, has this characteristic still more developed. Smell and taste, on the other hand, Sanford considers of little importance to civilized man.

Perception, as we have already seen, is essentially a matter of retaining certain qualities of things and not attending to others, and this shading or emphasizing is what gives differences of meaning with different people who are perceiving the same thing. But behind these differences there is still the sensory experience, and this gives the boundary. Roughly speaking, these limits are as follows: Touch gives us the world of matter, force, and energy; active touch especially gives us the sense of efficiency and freedom. Hearing gives us the symbols of thought, and the organic and general sensations the sense of self and the basis of our emotions. Sight gives us especially the larger relations of space and of objects in space, and, in connection with touch, the object as a whole.

But just as striking as the importance of these senses as the basis of knowledge is the other fact, that they are of relatively little use unless attention and interest direct them. We are amazed to see how little a blind deaf-mute like Helen Keller lacks of normal mental development, but the inference we should properly make from such cases is that children with normal senses are greatly neglected or maltreated educationally and so do not attain nearly their normal development. This appears in various recent educational developments both positively and negatively.

Negatively, we should consider the various tests on the contents of children's minds. As far back as 1869

the teachers' union of Berlin undertook to find out what children just entering school knew about their environment and how much they differed. They found that many children had never seen important squares and monuments near their homes; only about half knew what a circle was; less than half a sunset, meadow, triangle, forest, herd of sheep, tempest, sunrise; less than one third oak, plow, dew, lake, harvest; only one tenth a river, and so on. Large percentages of children, therefore; lacked ideas which were the basis of all school instruction. In 1879 Lange obtained corresponding results on eight hundred children. In 1880 Hall undertook a far more extensive investigation on Boston children, which was followed three years later in Kansas City by a similar experiment by Greenwood on children who had been in school a year. At the same time, without knowing Hall's work, Hartmann tested children entering the Annaberg schools for five successive years. In 1893 and 1894 Seyffert undertook a similar investigation in Zwickau; in 1898 Olsen tested five thousand six hundred pupils in Varde; and in 1903 and 1904 Engelsperger and Ziegler tested two hundred selected children entering the Munich schools. Finally, in 1909, Libby compared one boy from a good home, orphanage children, and public-school children, white and colored children. He also tested four hundred and eight boys and girls just entering high school.

Contents of children's minds

The methods of testing and questioning, as well as the lists, varied somewhat from study to study, and we should expect differences in the various reports due solely to environment. Nevertheless, the ignorance of various fundamental ideas is strikingly shown in all these studies, as is evidenced by the following list:

CONTENTS OF CHILDREN'S MINDS ON ENTERING SCHOOL
PERCENTAGE OF CHILDREN IGNORANT

	Berlin	Hall	Green-wood	Hart-mann	Olsen's boys
Hare (or rabbit)	76			84	37
Hen		19	.1	72	19
Frog	50	50	2.7	76	10
Butterfly	40	20.5	.5	51	30
Pine tree		87	65.6	78	37
Apple tree				77	
Flowers				51	10
Tempest	22			41	
Rainbow	23	65	10.3	63	10
Sunset	38	53.5	19.5	88	64
Sunrise	70	56.5	16.6		64
Phases of moon				72	46
Days of week				89	37
City hall	64			37	28
Railway station				35	
Potato field	37	61		46	10
Snow landscape				58	28
Cube	31			61	82
Counting 1 to 10				34	10
Coins					
Sickness				42	10
God				41	37
Jesus				86	73
Father's name	15			39	19
and business	11				

The original lists used are much larger and range over the real fom common religious and moral ideas as well. The lists were made from the words in reading books, the common objects in the child's environment, and the ideas necessary for him to have in order to understand the teaching of the first year in school. Certain inferences can plainly be drawn from them:

1. The teacher cannot safely assume knowledge of any one thing on the part of all the pupils, and hence should

start out with pupils just entering school by talking with them a great deal to find out what they do and do not know. Practically, Hartmann revised his lists until he got one which is used in the Annaberg schools twice a year, at the beginning and end, for the first-year children. He found that the children who did best in these tests were also the best in school work, and that by noting which groups of ideas the child knows best we can tell rather definitely his interests and ability. Accordingly, after the tests have been given to the children just entering, the children can be classified so that the teachers can fill up the gaps, and when the tests are given at the end of the year they can be reclassified. The best test-ideas in his opinion are: hare, hen, frog, butterfly, pine tree, flower, tempest, rainbow, moon phases, days of the week, child's home, city hall, railway station, potato field, snow landscape, cube, counting from 1 to 10, work in the field, baptism, coins, sickness, God, Jesus, certain localities.

2. The best preparation for school training is plenty of contact with natural objects, and wise parents will see to it that children have playthings and possessions which give a wide range of sensory qualities.

Bright, pure colors, and harmonious combinations of them, beautiful forms and sweet sounds, should be provided. For the hand, all sorts of objects, hard and soft, smooth and rough, accompanied by all the other touch qualities, should be supplied, and they should be of such a nature that they can go into the mouth without injury. A child must have objects to handle, even though we do object to having our nice things spoiled by hot little hands and wet mouths. If a child cannot handle things his knowledge of them is always imperfect, and so he must be provided with

things that he can work over to his heart's content.

Hall found that kindergarten children were distinctly better than those who had not had this training.

In the lists given the children, country children were better than city children, but of course other lists might be made in which city children would excel. The fundamental question, however, is: What ideas are of the most value? What ideas does the child need most in his daily life and in understanding what is going on about him?

Kindergarten

Perhaps, in the light of the above, we ought to say that what he most needs in the beginning are not ideas so much as all sorts of sensory-motor experiences, and that these need a careful setting and gradual interpretation by parents and teachers as the child's interests develop. The kindergarten and the Montessori system both undertake to fill this need after babyhood. The aims and methods of the kindergarten are so well known that they need not be discussed here. The intuitive genius of Froebel saw many truths that psychology has rediscovered since, and the only regret that one can have is that—as is always the case—some of his followers violate his spirit to follow his letter. Instead of seeking and joyously accepting the rich material and methods now open to them, as Froebel himself would so gladly have done, they limit the children to the narrow range of Froebel's individual environment.

Montessori schools

The Montessori method and apparatus have been so widely advertised that they perhaps need more a sober second thought than a description. Dr. Montessori's training was chiefly with subnormal children, and she herself expresses her great obligation to Itard and Seguin, two of the best known teachers of defective children. As her schools are conducted in Rome under her own direction, the method is

briefly as follows: The parents agree to certain definite conditions before the children are accepted, and children are excluded who are dirty, not amenable to discipline, or whose parents fail to live up to the terms agreed on. The problem of discipline is thus much simpler than that of the public kindergarten or school. Children between three and seven years are accepted, and are kept in the school from eight to nine hours, about two hours being spent in formal work, and the rest in preparing and serving meals, sleep, play, gymnastics, exercises of practical life — such as learning to dress and undress, washing, learning how to walk and sit, handle objects, and so on. In this long day, Dr. Montessori's ideal is that the children shall be left free to express themselves, the teacher's part being chiefly to observe each child carefully and to remove unobtrusively obstacles to this expression. The child takes the initiative instead of the teacher, and so no two children may be doing the same thing at the same time, and one child may do only one thing as long as he pleases. It is auto-education instead of education by the teacher. The results in these schools at least have been most happy. Not only are the children alert, happy, spontaneous, but they are graceful, skillful, and far beyond most children of their years in the knowledge acquired. Reading and writing are done easily by three- and four-year-olds, and they can take care of themselves and children a little younger in an astonishingly capable way.

Apparatus

How are such results attained? Judging from the effective advertising in this country, they are due to the Montessori apparatus, and any teacher who chooses to pay the sum asked for this outfit, and to get a smattering of Dr. Montessori's theories in one way or another, can get the same results. Such

claims are of course absurd, and it would not be surprising if on account of them there was a reaction against the entire system in this country within a few years. The Montessori "apparatus" consists of a large number of pieces like the following: little squares of fabrics, cotton, woolen, silk, linen, of different weaves; rough and smooth things, metals, and so on. For color there is a set of silks, with various shades of each color. There are also devices for teaching various figures, and insets of metal; sets of sandpaper letters and smooth paper letters. To teach other things there are two pieces of cloth and leather to be buttoned, hooked, laced. Most of the "apparatus," except the insets, any teacher could easily acquire at practically no cost by going through the rag bag, button box, china closet, writing desk, tool box, and carpenter's bench, and from time immemorial mothers have done this very thing. Why now should these be made into "apparatus" and patented under the strictest restrictions? The insets, again, though not in quite this form, have been used a long time in work with defective children. To one who looks over the "apparatus" with a view to seeing how much it leaves out in the way of sensory qualities, it seems astonishingly meager. Active touch is the best provided for, but it works upon small things entirely, and no provision is made for all the sensations from liquids or from many natural objects—such as dirt and sand, leaves of different kinds, the fur, feathers, and skin of different kinds of animals, and so on. Of course these are in many cases obtained in the schools, with the skilled teachers and beautiful surroundings of the schools of Rome. But how about the unskilled teacher in the public city school? The ear has little provision made for it. The eye, of course, is used in all the handling of the materials, but

not in the tracing of the insets, and one wonders what is done to train visual observation. The colors provided are of doubtful purity. Altogether, if the system has to depend for its success upon the "apparatus," its future is more than doubtful.

But its success in fact has been due to the personality and skill of Dr. Montessori herself and her coadjutors, to the freedom and the favorable surroundings, and to the fact that on account of the long hours the children can live nearly their whole waking life, with all its varied activities, under the influence of the teachers. The apparatus is relatively unimportant, and, in fact, in one school where its introduction was delayed for several months the children progressed almost as well as in the other schools. Dr. Montessori should have full credit for emphasizing again the importance of sense-training and of freedom of initiative, and for showing us what can be done by one who appreciates the importance of these two things, but all educators must regret that her theory has become so bound up with her apparatus that to the general public the two terms are almost synonymous.

Furthermore, it is doubtful, pedagogically, whether normal children should be forced to acquire their sensory experiences in isolation. What is the relative educative value of these two experiences—one in which the child fingers a piece of woolen cloth and looks at the skein of red; and another in which the child plays with a red worsted ball? Objects, things which have uses to the child, which may acquire meaning, about which activities, emotions, ideals may focus, are infinitely more educative than scraps of cloth. And again, if these objects are those which the race has used and is using to satisfy its fundamental needs, surely there will be another educative value added and an emotional response from the

child which a skein of silk and a row of buttons will never extort. A bright red apple, a doll to dress, a splash in the tub, a race in the wind, the song of the trees and the birds — these are the child's life, not redness, buttoning, wetness, motion, pitch, and so on. Over-analysis is the bane of school work. The child is a whole child, and naturally deals with wholes. Only gradually do special interests and needs lead to analysis, and rarely do these interests demand the separation of one sensory quality from all others. Most of us deal with objects. The artist may look at objects as only splashes of color, and the musician may hear a melody as only differences of pitch, but such abstractions are far from the average adult, and much farther still from the child.

To sum up the situation briefly, we must never forget that the senses and perception have developed in the service of living and that they will grow best when they get the most complete exercise in the normal activities of life, if only that life is a full, all-round life. An ideal home and school would complement each other, therefore, the two together covering the whole range of life activities, and the school of a given community would differ from those in other communities just as its homes do.

REFERENCES

The references of the preceding chapters, especially the studies of individual children, nearly all bear upon the use of the senses and perception. The discussions in the textbooks on psychology give the general theory of perception and apperception.

Boyd, Wm. *From Locke to Montessori.* Holt and Co., 1914, 268 pp.

Colvin, S. S., and Meyers. Imagination and Ideational Types . . . and various Sense Departments. *Psy. Rev.*, Monog. Sup., 1909, Vol. XI, 85-126.

Dell, J. A. *The Gateways of Knowledge.* Cambridge Univ. Press, 1912, 171 pp.

The Learning of Sensible Material. *Jour. Ed. Psy.*, 1912, 401-6.

Fisher, Mrs. D. F. C. *A Montessori Mother.* Holt, 1912, 240 pp

Foster, W. S. Effect of Practice upon Visualizing. *Jour. Ed. Psy.*, Jan. 1911, 11-21.

George, Anne F. First Montessori School in America. *McClure's*, 1912, 177-187.

Gesell, Arnold L. and Beatrice C. *The Normal Child and Primary Education.* Ginn, 1912, 342 pp. (Very good discussion of touch.)

Griffin, J. T. Practical Illustrations of the Law of Apperception. *Ped. Sem.*, Sept. 1912, 403-415.

Hall, G. Stanley. Contents of Children's Minds. E. L. Kellogg & Co. $0.25. (Also in *Aspects of Child Life.*)

Henmon, V. A. C. Relation between the Mode of Presentation and Retention. *Psy. Rev.*, 1912, Vol. XIX, 79-95.

Holmes, W. H. Montessori Methods. *Education.* Vol. XXXIII, 1912, 1-10.

Houdin, Robert. *Memoirs.* Phila., 1859. (Interesting as showing how he trained his power of observation.)

Libby, Walter. Contents of Children's Minds. *Ped. Sem.*, 1910, 242-272. (Continues Hall's, and reports on later work, as well as his own.)

Monroe, W. S. Perception of Children. *Ped. Sem.*, 1904, 498-507.

Moore, C. C. *Treatise on Facts, or Weight and Value of Evidence.* 1908, 2 vols., 1612 pp. (A discussion of the defects in legal testimony, the errors in common observation, etc.)

Peterson, Fred. Beginnings of Mind in the New Born. *Bull. of Lying-in Hospital.* N. Y., Dec. 1910, 24 pp. (The most important article on condition of sense-organs at birth.)

Sanford, E. C. Function of the Several Senses in the Mental Life. *Am. Jour. Psy.*, Jan. 1912, 59-74.

Smith, Anna T. *Montessori System.* Wash. Gov. Print., 1912, 30 pp.

Smith, Theodate L. *Montessori System.* Harper, 1912, 77 pp.

Stevens, Ellen Yale. *Guide to the Montessori Method.* Stokes, 1913, 240 pp.

Tozier, Josephine. Montessori Apparatus. *McClure's*, 1912, 289-302.

Ward, Florence E. *The Montessori Method and the American School.* Macmillan, 1913, 231 pp. Bibliog.

(The German and French studies on testimony (*Aussage, témoignage*), referred to in the chapter on memory, also have important bearings on perception.)

CHAPTER VIII

MEMORY

1. In getting data from adults, have them write out their earliest memory. In doing so they should state (1) the age at the time of the event; (2) how they know that the memory is true and not obtained merely from some one else's account; (3) what influence it had, if any, upon their later life.

2. Teachers can get practical suggestions by testing the pupils in any given room to see what subjects taught they remember best, and for how long. In giving such tests the essential thing is that they shall be unexpected, so that the pupils have no chance to prepare for them.

3. Modifications of the Aussage tests described in the chapter are easily given and suggestive.

Memory and sensation

When a baby sees or hears or has any other sensation, however vague it is, there is still some modification of his brain, some chemical change in the structure of his nerve cells, and this change remains when the sensation has passed away. When two senses are appealed to at once or in close succession, as in seeing the breast and nursing, two or more brain centers are affected, and for some unknown reason fibers of connection are likely to form between them. When this has happened a number of times, so that the fibers are well established, the baby begins to show signs of recognition. This happened as early as the twenty-second day with Preyer's boy.

We also find memory showing itself faintly in another

way when the baby turns to look for some object that has just moved out of sight. Here there has hardly been time for the retinal activity that was roused by the object itself to die out; the memory has persisted only a short time after the sensation, but still there is the beginning of memory.

These first traces left by sensations upon the brain are sometimes called organic memories. They are not mental pictures of past events, but they make it possible for a baby to do with greater ease the acts which at first were very imperfect. For example, the first step in moving the eyes simultaneously is thus made possible.

Organic memories

Organic memory is what makes the earliest perceptions possible. We have seen already that perception differs from pure sensation, since in it the sensation has become bound up with other sensations, or rather with the traces of other sensations. The binding is done by organic memory. The nerve centers receive a stimulus differently when they have already been modified by previous stimuli. They now contain within themselves the changes caused by previous seeing or hearing, and so are better prepared to receive again the same sight or sound or one like it. It is very much like getting acquainted with a person. The first time we meet him, we are rather formal, and the interchange of thought is not very free; the second time it is freer, and so on. So the brain cell does not respond readily at first, but later is more easily aroused.

Perception and organic memory

The same thing occurs in forming a habit, except that the process is more complicated. Usually we limit the term "habit" to series of *movements*, but we also hear the term "habits of *thought*," and we seem to form habits

of thought much as we do habits of action. Perception — *seeing* objects as solids and as distant, as having characteristic tastes and touches and sounds — is simply the most inveterate mental habit formed, and is much the same for all people. Other associations, such as connecting a certain dress or place with a certain person, are also mental habits, but they vary greatly with different persons, and they usually call into play memory images as well as organic memories.

Organic memory and habit

In the case of habitual movements, we saw that a baby soon learns to put his hands to his mouth; he gets a connection established between the feeling of his arms when they move in a certain way and the pleasure from sucking his thumb. Any movements that occur simultaneously or in quick succession, if they are repeated often enough, and are pleasurable or aid in reaching some end, will thus become connected and form an habitual series. Then any one movement in the series will call out the next, this the next, and so on.

Such a habit is an organic memory in the baby. He has few or no distinct images, but certain connections have been formed between certain nervous centers. The same is true of the adult, in such cases as learning to ride a wheel. It would be impossible for us to *describe* the various positions that we must assume in order to keep our balance, and yet our nerve cells have learned their lesson so well that we rarely get a tumble. The education of the spinal cord and brain centers to perform long series of movements accurately goes on apace by means of organic memory, that is, by means of the changes made in the nerve cells and their connections, which persist and modify their future action. All this, it must be understood, takes place at least below the level of clear consciousness, and often below the level

of consciousness itself, in the subconscious processes.

Habits, then, may be formed in the baby or small child simply by regularity in the conditions about him — regularity in his meals, in the kinds of food given him, in his hours of sleep and waking, in everything in his daily life. The rapid growth of his nerve cells makes education and the acquirement of habits especially easy.

With the older child and the adult habits are also formed voluntarily as well as involuntarily. We decide that we want to learn carpentry or embroidery, or that we will learn to tell the truth or to acquire some other virtue. Here we must in the first place keep the end that we wish to attain so clearly before us that old associations cannot besiege us or forgetfulness overtake us. A desire to reach some end is so essential that it is of little use to force a child to do daily a thing that he dislikes. The pain which he constantly connects with the act or the study is so much stronger than the other connections that are established that even after years of discipline the habit falls off within a month or two when external pressure is removed. We all know that a teacher who wakes herself at six o'clock for nine months of the year will sleep until eight through the summer vacation, after only two or three mornings of wakefulness. So a child forced to go through certain mental or bodily movements for which he feels only dislike drops them as soon as restraint is taken away.

There is one possible exception here when a child has a prejudice toward a study or act, but finds it pleasurable when he actually begins it. In such a case a habit may be formed, but not unless the original dislike yields to a later pleasure or to a recognition of the value of the habit. When a habit has been formed, the first

clear attention which was necessary for its performance is no longer required. The nerve centers have learned their lesson.

Importance of good habits

Just because a habit of thought or action frees the mind for higher things, it is important that a child should at an early age acquire the largest possible number of good habits which he will not need to unlearn later. It is unpardonable for parents so to neglect a child that when he is twelve or fourteen years old he has to spend his time in learning regular habits of eating, habits of cleanliness—all those habits which relieve him from constant thought of his bodily wants and make social intercourse easy. The boy of this age has before him the more important task of forming habits of moral thought and action. He is shaping his ideal of character, and he ought not to have to struggle constantly over these little things which a small child learns so easily.

It is one of the important tasks of parents therefore to see to it that the little child grows insensibly into good habits of taking care of his body, and into the social habit of considering others equally with himself.

Earliest recollections

From another standpoint we can see how deep the traces of our early experiences go when we consider our earliest recollections. It has always been of much interest to men to ascertain how far back their memories go, and it is also of interest to teachers and parents to know whether the experiences of infancy and early childhood will be remembered by the adult.

Sometimes we find a person who claims to remember an event occurring in the first year of life, but few of us can go back of the fourth year. Even then we are likely to confuse true memory with descriptions that

have been given to us. Do events previous to the fourth year, then, have no effect upon later life? On the contrary, in those important years many things have been acquired—notably walking and talking—which through constant practice are never forgotten, and it seems probable that these early experiences leave traces upon the growing mind and brain that determine to a large extent the emotional temperament of the child—the likes and dislikes, which either direct him well or must be fought and conquered with much effort later on. The observations of the Freudians on morbid cases are very suggestive here. It is well known that if a little child receive a severe fright, fear is likely to persist far into adult life, although the person forget the occasion that gave rise to the fear. The image is lost, but the organic and emotional effects persist. Dr. G. Stanley Hall tells us that upon visiting the farm where he lived until one and one-half years old, the feeling of familiarity was strong, and at special places a decided emotional tone arose, without any knowledge of what experience was connected with that place. We have other records of adults going to places connected with babyhood or early childhood of which they had never been told and having this same emotional tone and feeling of familiarity. Most interesting is the following anecdote told of Helen Keller. She became deaf and blind when about one and one-half years old. Before that time her father used to sing to her, especially two plantation songs of which she was very fond. One day, when she was a girl of eighteen and had been taught to speak, and was at the piano "feeling the music," those songs were played to her. At first she was bewildered, and painfully excited; then she repeated some of the words of one of the songs. There were evidently connections between

the touch center and the auditory and word centers, such that these dispositions, left from the first year and a half of life, could be revived. There are other cases also of disease bringing back memories of very early childhood.

Now, if this be generally true, the first four years of life are as important educationally as any that succeed, or rather, they are more important. Nothing else can be so important as to start a child out in life with good health and with a healthy equipment of emotions and habitual actions. That these cannot be supplied by talk, is evident. Example is the only teacher. Everything that is given to the child should be of such a character that the feelings and actions aroused by it can be the basis for the finer emotions and actions that come later. He should live in an atmosphere of trust and confidence, where there is no fretting and worry, much less dislike and hate. The music and stories that are given him should cultivate the positive, serene, fearless, high-minded attitudes. I have seen some little children whose confidence and joy were such as to make one believe almost anything possible in this direction. We must be sure that our children's restlessness and whining are not simply the reflection of our own worry and cowardice before we can assert the powerlessness of early surroundings to shape the very little child.

So far, memory has been considered principally as a matter of the changes in nerve centers, but in its narrower meaning memory includes rather the mental side — the revival in consciousness of some previous experience. How this conscious revival of an experience develops is what we wish to trace now. Preyer's observations on this point may be given in full here, as most other observers agree substantially with him. The first memory image is one of taste,

Development of memory images

followed by smell, touch, sight, and hearing, in the order given. On the twenty-second day, his boy associated the breast with nursing, as was shown by his movements. During the second and third months, the presence of strange faces excited wonder, but the absence of familiar faces was not noticed. The memory for *faces* was the first visual memory. In the twenty-fourth week, the baby saw his father's image in the mirror and at once turned to look at his father, evidently recognizing the image. In the twenty-sixth week, he repeated this, and compared the face with the image, turning from one to the other several times, but he had as yet little distinct memory. In the seventh month, he did not recognize his nurse after an absence of four weeks. Not until the forty-third week did he miss his parents when they were absent, or miss a favorite toy when it was gone. Another observer says that one little girl of ten months recognized her father after four days' absence. Perez also quotes the case of a child seven or eight months old who very much wanted a piece of bread that looked like some favorite cake. When he tasted it, he threw it away angrily, showing that he had an image of the taste of the cake, with which the reality did not agree.

In the fifty-seventh and fifty-eighth weeks, in looking at the image in the mirror and at a picture of himself, Preyer's boy apparently recognized both and passed his hands to the back of each, much puzzled by the differences he saw. Evidently the memory was becoming more distinct and detailed. In the sixtieth week he recognized his mother's image as different from the reality.

In the sixty-first week, he burned his finger in the candle, after which he never put it in again, though he

would jokingly make movements in that direction. The memory image of the pain was well developed, though memories as a rule were not stable. In the twenty-third month, he recognized the playthings from which he had been parted nearly three months, which proves him well started toward the development of imagination.

Freeing of memory images

In these first experiences the baby's memory is very vague. As James says, his world is a "big, blooming, buzzing confusion," whose parts have to be made distinct from each other and shaped into distinct, unified objects. One certain experience, like being fed, is repeated under many conditions — now in light, and now in darkness, now in one room and now in another. The two constant things, that his mother is always there and that his hunger is always satisfied, by their constant repetition and great satisfaction become impressed upon him, so that he soon recognizes his mother. Take also his recognition of his mother's face. At first certainly it is to him only a light patch against a darker background, moving from one place to another. But as he sees more distinctly and is able to follow it with his eyes, he learns that all the different appearances, side and front and back views, belong to his mother's face, and the constant repetition of that face with its accompaniment of increased comfort soon teaches him to recognize it apart from any one place or time. In brief, the memory image becomes freed from memories of any particular time and place by having the one constant experience — the mother's face — in many times and places. This is the usual experience.

When psychologists use the term "image," they mean any revival of a former experience in a form distinct enough for us to look at it mentally and describe it. The

revival of the sound of a piano, of the color of a sunset, of the taste and smell of coffee, of the "feel" of velvet, and of the exertion of running or stretching, are all equally images. If we place these in some definite time when we experienced them, we say the image is a memory image; while if we combine them in new forms, we approach imagination. Memory images, that is, reproduce our past life in much the same form as we lived it; imagination makes new combinations.

Memory images

Images are evidently derived in the first place, therefore, from our sense-life; that is, we get our materials of knowledge through the special sense organs — the eye, ear, skin, nose, tongue, and the movements of the muscles. The feelings aroused in this way directly by objects, we call sensations or perceptions of sight, sound, touch, smell, taste and movement; and when, in the absence of the object, the sensation or perception is revived or remembered, we have images of sight, sound, and so on, or, to use the Latin terms, visual, auditory, tactile, olfactory, gustatory, and motor images.

If you recall your childhood's home, you will probably get good examples of most of these. You can see in your mind's eye the old house, its various rooms and the people in them (visual); you can hear your mother's voice (auditory); you can taste some especial food that she excelled in cooking (gustatory); you can probably smell some characteristic flavor or garden product or perhaps some medicine that you had to take (olfactory); you can feel your mother's kiss or, perhaps, some whipping or spanking you received; and you will probably find that almost all your memories of the place are bound up with your feelings of movement about it, climbing trees and haymow, and so on.

Which of these classes of images is most common, and

whether or not there is any relation between the ideational type and the best memories are important questions for teachers. Schuyten, Netschajeff, Lobsien, Lay, Colvin, Meyer, and others have made observations which give valuable suggestions. Very few of them bear upon little children, especially those who cannot yet read and write with ease, but there is some evidence to indicate that for such children auditory-verbal images are the most common, and that oral instruction is best for them. Rousselle even advocates that at first children shall be allowed to study aloud. From eight or nine years on, however, the auditory image decreases relatively to the others, and various spelling tests indicate that it can be omitted in learning to spell without materially adding to the errors, and that the best results are obtained by a combination of visual and motor imagery. Netschajeff and Lobsien, who used similar methods on children between eight and eighteen years of age, got similar results. Netschajeff (687 children) found that only 11 per cent of his boys had any one strongly predominant type of imagery; of the mixed type, 32 per cent were visual-motor; 5 per cent motor-acoustic, and 2 per cent visual-acoustic. The other 40 per cent seemed to use various forms with about equal ease. Both he and Lobsien found the greatest relative increase in memory between ten and twelve years. Their experiments, and also those of Colvin and Meyers, seem to prove that from eight years to ten, at least, the predominant type of imagery is visual and concrete. As we go up the grades this is replaced by verbal imagery and more abstraction. Motor and auditory imagery are of less importance than has been assumed, and in some cases may be a positive hindrance to learning.

Most common

The educational inferences are fairly evident. The so-called imaginal or ideational types are not as inborn and distinct as we have supposed, but depend largely upon the character of the training. If we consider how far ahead of the other senses sight is in bringing us knowledge, it seems inevitable that visual images shall predominate over the others, just as it does that what is first learned through a given sense is best retained in the same image form. There are doubtless some exceptions here in the case of learning highly abstract demonstrations, but not in remembering perceptual experiences.

More important for remembering than the image type are interest and attention. These may rest either upon an instinctive basis or may be artificially stimulated by the conditions under which the child lives. A child may be highly interested in anything by attaching to it rewards, approbation, punishment, and so on, but here again it is the work of the school to ascertain what natural interests can be made most useful in life, and to develop them, while at the same time ignoring or transforming those which are now useless or harmful.

Interest

In 1885 the experiments of Ebbinghaus on memory were published, in which the attempt was made to state exactly the facts of remembering and forgetting. They have stimulated many experiments both upon memory and upon the learning process, and though they have been corrected in various ways by later work they should be mentioned on account of their historical interest. We now have a large body of facts obtained both from adults and children on the basis of which we may give this general account of remembering: In the case of nonsense material, about three fourths is remembered one hour after learning; and about one half eight hours after. But between eight

Laws of forgetting

hours and one day there is a rise to about two thirds and from then on a fairly regular forgetting, till on the thirtieth day about one fifth is remembered. There are wide individual variations in forgetting, as we should expect. The difficulty of remembering seems to bear a fairly regular relation to the length of the nonsense series, and does not increase disproportionately more in the longer series, as was at first supposed.

Sense material, of course, requires less repetition than does nonsense, but the general law of forgetting is the same. Individual differences are greater here, but, in general, the one who learns easily forgets easily, because he gets fewer repetitions. Practice in learning tends to equalize all, and the slow learner may become more rapid by concentrating attention more, while the rapid learner may become more thorough by more repetitions.

Method of repetition

The method of committing to memory must vary more or less with the material to be committed. If it is relatively short and easy, the best way is to repeat the whole each time, as this gives all the proper connections. If it is long, however, the middle part is likely to be forgotten sooner than the rest, because by the time it is reached attention flags and there is not yet the stimulus of being near the end. In such a case, especially if some parts are more difficult than others, the best way seems to be to divide the material and learn it in parts, but with every now and then a reading of the whole. Again, to secure permanent retention, if the material is not very easy relatively few repetitions on successive days will secure better results than will many repetitions on one day. This seems to be due to the fact that time is essential in order for impressions to become set and assimilated.

This same fact is of importance in another connection,

in giving an interval of five or ten minutes between recitations, in which attention shall be left entirely free. Some experiments indicate that when this is done in school work the different lessons are better remembered than when attention is immediately forced from one subject to another. On this account it is well in the case of individual pupils to have recitation and study periods alternate if possible.

Free intervals

In general, children fatigue more readily than adults, have less attention, and so can recall less readily and require more repetitions than adults.

In learning anything, and more especially in learning anything requiring motor functions, such as using a typewriter or telegraphic key, learning goes on rapidly at first and then more slowly, until a level is reached where no improvement is apparent. If practice be kept up, a time comes when there is a sudden rise in skill and speed, followed by the same slowing down and apparent cessation of improvement, and later another rise. These levels or plateaus are due to different causes. Sometimes they indicate that the person is assimilating what has been learned and has no extra energy and attention to use on new things. Sometimes, again, they indicate that the limit of skill with the old method has been reached and there will never be more improvement unless new methods are found. Or, again, there may be a let-down of interest and attention, and the subject may run along on old habits.

Learning plateau

In general, in the learning process the more individual and shorter elements are organized into larger and larger wholes, and to do this attention is necessary all the time, but repetition must also be sufficient to fix the various factors. All of the subjects soon find a rhythm of repetition which greatly aids them.

Schuyten's tests on school children suggest that memory is better in spring and summer than in fall and winter, and that the most intelligent children have the best memories, though sometimes the stupid ones may excel in mere verbal memory.

Memory span

Mr. Jacobs and Mrs. Bryant took up one of the details of Ebbinghaus's work and experimented with school children to ascertain how long a series could be learned with one repetition; how the span of memory (that is, the length of series thus learned) varied with age, and what relation it bore to the pupil's rank in school. They used digits, omitting 7, and letters, omitting w, as more uniform in sound than nonsense syllables. They give the following table for the span of girls.

Age.....	8	9	10	11	12	13	14	15	16	17	18	19
No. girls	8	13	19	36	41	42	42	72	66	50	30	14
No. nos.	6.6	6.7	6.8	7.2	7.4	7.3	7.3	7.7	8	8	8.6	8.6
No. let'rs	6	7	6.6	4.6	6.5	6.7	6.7	7.4	7.9	7.3	8.2	8.9

This shows that the span increases with age. They found also that the children with the largest spans were usually those whom the teachers classed as their best students, although there were some exceptions. Bolton also found that the highest span is a measure of the power of attention; but he puts the limit of the memory span for numbers at six for public-school pupils. The span for girls is also higher than for boys. All observers find that the girls' memory is better than the boys'.

Objects: words

Kirkpatrick experimented upon pupils from the primary grade through college to find what kind of memory images were best held. To do this, he first made three lists, two of ten *words* each, and one of common *objects*, avoiding associations as much as possible. One list was *read* to the pupils; the words of

the second were *shown* one by one upon the board; and the *objects* named in the third list were shown. The pupils were then asked to write out as many words in each list as possible. It was found that 6.85 words out of the ten in the list *heard* were recalled; 6.92 of the ten in the list *seen;* and 8.28 of the *objects* seen; that is, the auditory memory was poorest; the visual memory of the word next, and the memory of the object itself the best.

The memory of the college students was but two words better than that of the primary children.

They were then given three more lists of words. The first consisted of names of sounds, and the pupils were asked to think of the sound; the second, of names of colors, or lights and shades, and they were asked to think of them; the third, of names of objects, and they were asked to recall the object. They were then asked to write out the lists. The results show that 6.98 names out of the ten in the first list were recalled; 7.91 of the ten in the second; and 7.48 of the ten in the third. That is, the visual images of colors, or lights and shades were slightly better than the auditory images of sounds, or the memories of objects.

After three days, they were asked to write out what they could recall of the first three lists, with the startling result that .91 of list two, and 6.29 of list three were recalled. That is, while the visual memory-average of the words had declined to less than one word, from the original 6.92, the memory-average of the object itself was lessened only by two from that immediately after the experience. There could hardly be a stronger illustration of the superiority of things to words in early education, and of the activity of the senses and its effects upon memory.

The characteristic age differences and those between

boys and girls, as shown by Netschajeff's tests and Lobsien's duplication of them, are as follows: Netschajeff tested 687 boys and girls between nine and eighteen years of age. Twelve objects were shown silently for two seconds, and the pupils wrote down as much as they could remember. Then twelve inarticulate noises were made; twelve numbers were spoken; twelve names of visual objects; twelve sound names; twelve suggesting touch, temperature, muscular sense, teaching, feeling, and abstract ideas. Lobsien had 462 boys and girls nine to fourteen years of age and had only nine in a series. Both agree that memory increases with age, but differ in the placing of it. Lobsien found a marked increase for all forms about the twelfth year in the girls and for number, touch, sound, and feeling names for boys in the tenth year. Netschajeff found, however, that the increase in memory of feeling names does not come until puberty for boys and girls, and about the same time memory of abstract ideas rises also. Both boys and girls remember objects better than names, but girls have better memories of words with feeling connotation and boys of those more abstract. The greatest differences between boys and girls, in Netschajeff's tests, come between eleven and fourteen.

Memory and sex

The *Aussage* tests of Stern and his students bring out still other aspects of memory. He showed for one minute to 47 boys and girls, two to eighteen years of age, a brightly colored picture of a farmer's living room. First he asked them simply to tell what they had seen (*Bericht*), and when he was certain they could remember no more, he questioned them (*Verhör*), some of the questions being intentionally misleading or suggestive. He found three distinct stages varying with the age. With the younger children,

Aussage tests

objects were simply named, often without the use of sentences; with the next older, acts or movements were described chiefly; while with the older the qualities and relations of the persons and things shown were given. That is, the younger children used chiefly nouns; the middle ones, verbs; and the older, adjectives and prepositions. In the spontaneous account (*Bericht*), on the average 94 per cent. of what was given was correct, but only two fifths of what was remembered came spontaneously, the other three fifths coming from questions. The amount given spontaneously doubles between seven and fourteen years and triples between seven and eighteen.

With regard to the suggestive questions, the most interesting thing is that between seven and fifteen the ability to withstand suggestion is doubled. In answering non-suggestive questions, age seems to make little difference as to correctness, and in the spontaneous narrative the pupils graded high in class make the best records. In answering non-suggestive questions, the percentage of error with different experimenters varies from 20 to 27 per cent only. Stern believes that this percentage will be found fairly constant for both sexes and all ages, and that it stands for a general law of memory which may be thus stated: The degree of error in a memory is in a constant relation to its quantity. Various other experiments have been made to duplicate conditions in actual life, such as the subjects would be under if they were called upon to testify in court, but these we will omit.

As we should expect, experiments by Borst and Oppenheim show that the accuracy of the memory can be improved by training, but the improvement is not very great in these particular tests and seems to depend on improving attention or methods of observation of the objects. Experiments

Training memory

by Winch indicate that improvement in one form of memory may be followed by improvement in another. Thus, children given practice in learning poetry improved in learning history and geography, and children given practice in memorizing stories improved in inventing stories. These experiments have been questioned, but it is rather difficult to see why such results might not be attained in so far as the various processes tested all involve improvement of attention or of methods of observation.

Age and memory

Taking into consideration interest as well as age, Colegrove found that during the period from one to five, visual, auditory, and motor memories are very prominent. From the fifth to the ninth year, the motor memories of girls increase markedly but decrease from ten on; in boys, they increase slowly from five on, culminating at fifteen. In both cases we trace directly the effect of habits of life. Girls, after the tenth year, usually exercise much less freely than before, while boys after that age constantly increase the amount of exercise.

From ten to eleven, both boys' and girls' memories for near relatives increase; and from twelve to thirteen, decrease, but increase for all acquaintances, marking the entrance into wider social relationships so characteristic of adolescence. Between fourteen and fifteen, the visual and auditory memories of both increase greatly and also memories of places, doubtless marking the beginning of a wider æsthetic sense.

Educational applications

If the above statements are correct, is it not a mistake to postpone manual training, sewing, and so on, to the high-school age? Should we not, rather, put them at the time when the motor brain regions are so active, as this abundance of memories proves them to be? Again, what is to be done with the

child of the third grade when memory is comparatively poor? We saw before that this is one of the periods of rapid growth. Is it a time when school work should be lightened? That the auditory memories are best in children under fourteen, points to the value of beginning the study of languages early, and any work that demands memorizing and has little reasoning connected with it. With adults, the best way to memorize is to get a focus of interest around which memories can cluster. With the child this plan too should be followed.

Finally, the widening of memories for friends and æsthetic objects between fourteen and fifteen, points to the importance of widening the child's experience in both these lines. In all cases, we seem to see the close connection between interests and memory.

Conditions of good memory

In a former chapter we spoke of the effect of fatigue and health upon memory, showing that in proportion as health was poor or fatigue was great, memory diminished. Health and freshness are, then, two conditions for a good memory. On the mental side, to train a child's memory, take up a subject when his memory for that class of things is best and so present it that he shall feel its close connection with his own life and shall be on the *qui vive* to get information about it. Knowledge so obtained has many interconnections and holds together well. No other will endure.

Unusual conditions

Mothers and teachers not infrequently find certain mental peculiarities in their children that they do not know the significance of and are in doubt how to treat. Among these are "colored hearing," and number, word, and time forms. Quite a large proportion of people connect certain colors with certain sounds, or with certain words or letters. The

high notes of a violin may seem pale blue; the resonant trumpet tone, blood red, and so on. Each letter of the alphabet may have its characteristic color, or all the vowels, or only names of persons. It is practically impossible in many cases to find the origin of these various associations, but they may go back to very early memories, or they may be due to unusual congenital connections between the brain centers concerned. They do not mark any mental abnormality, and it is not wise to ridicule a child who has them. To him they are perfectly natural.

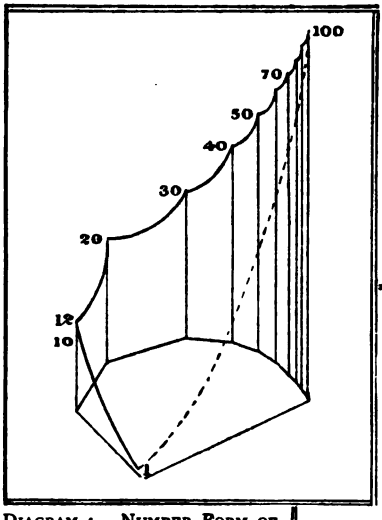


DIAGRAM 4. NUMBER FORM OF MR. WALTER LARDEN, FORMERLY OF CHELTENHAM COLLEGE, ENGLAND. THE FAINT LINES ARE TO SHOW THE PERSPECTIVE. (Galton.)

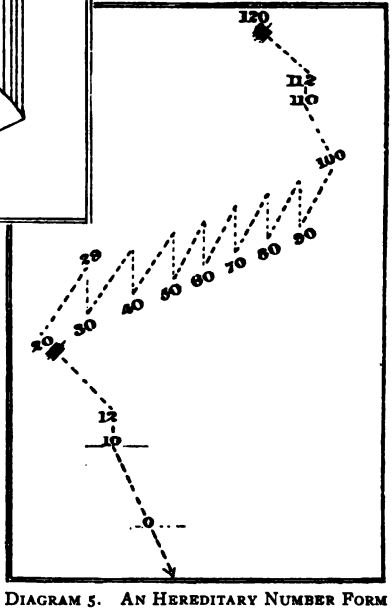


DIAGRAM 5. AN HEREDITARY NUMBER FORM COMMON TO A BROTHER AND SISTER. (Galton.)

Number, calendar, and alphabet forms are much more

common. It is estimated that of men one sixth to one fifteenth possess some kind of form, and of children and women a larger proportion. In all such cases, the numbers, days, or letters are arranged in a definite form in which the person always sees them. The diagram may be colored or not. Several forms are shown in Diagrams 4 to 9. This form is the same for the same person from year to year. It seems so necessary to the person that he can hardly imagine how he could do without it. It varies from the simplest arrangement to exceedingly complex ones of definite shapes, in which each number has its place.

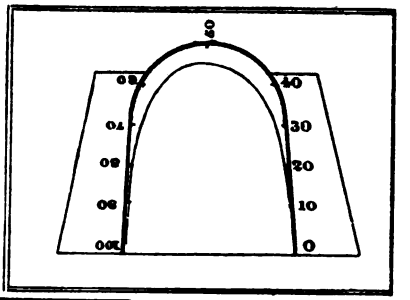


DIAGRAM 6. NUMBER FORM OF PROF. SCHUSTER, AN ENGLISH PHYSICIST. THE NUMBERS ARE ON A KIND OF HORSESHOE LYING ON A SLIGHTLY INCLINED PLANE. (Galton.)

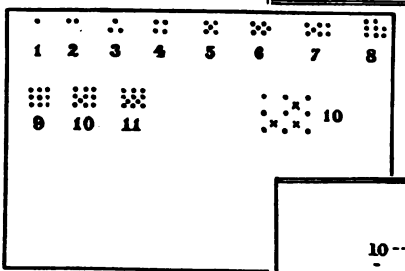


DIAGRAM 7. A COMPLEX NUMBER FORM MADE UP OF DOTS RUNNING UP TO 1,000. IN 10, ETC., THE ODD DOT MAY APPEAR AT ANY OF THE CORNERS MARKED X. (Galton.)

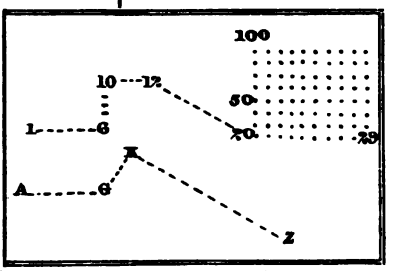


DIAGRAM 8. AN HEREDITARY NUMBER FORM SHOWING PECULIARITIES WHICH RUN THROUGH A WHOLE FAMILY.

Here, also, the origin is difficult to trace. In some cases

it seems to be hereditary—several successive generations having the same form. In others, its origin is hidden in obscurity. As with the colored hearing, it does not mark any abnormality, and the best policy is to leave it alone. On the other hand, one attempt at least has been made to teach a number form to all children, but the wisdom of this is questionable.

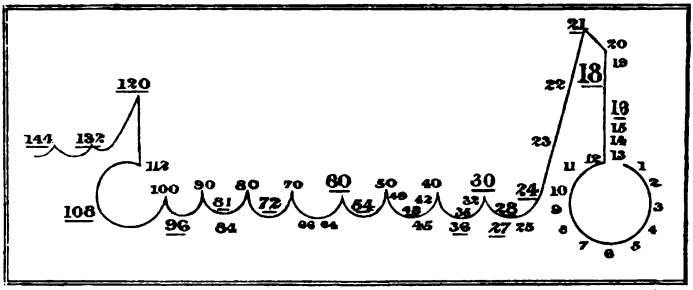


DIAGRAM 9. NUMBER FORM OF A GENTLEMAN WHO LEARNED TO TELL THE TIME AT A VERY EARLY AGE. THE MOST PROMINENT NUMBERS ARE THOSE FOUND IN THE MULTIPLICATION TABLE, ESPECIALLY 12. (Galton.)

REFERENCES

MEMORY, HABIT, LEARNING PROCESS

Aiken, C. *Methods of Mind Training.* Harper, N. Y., 1897, 110 pp.

Andrews, B. R. Habit. *Am. Jour. Psy.*, Apr. 1903, 121-149.

Angell, J. R. Doctrine of Formal Discipline in the Light of the Principles of General Psychology. *Ed. Rev.*, 1908, Vol. XXXVI, 1-14.

Bagley, W. C. Psychology of School Practice. *Psy. Bull.*, Mar. 1909, Vol. VI, 78-83.

Bair, J. H. The Development of Voluntary Control. *Psy. Rev.*, 1901, Vol. VIII, 474-510.

The Practice Curve. A Study in the Formation of Habits. *Psy. Rev.*, Monog. Sup., 1909, Vol. V, No. 2.

Baird, J. W. An Experimental Study of the Efficiency and the Development of Memory in Children. *U. of Ill. Study, Psy. Bull.*, 1905, Vol. V, 98-100.

Bean, C. H. The Curve of Forgetting. *Arch. of Psy.*, Mar. 1912, No. 21, 47 pp.

Bentley, I. M. The Memory Image and its Qualitative Fidelity. *Am. Jour. Psy.*, Oct. 1899, Vol. XI, 1-48.

Bergström, J. A. Effect of Changes in Time Variables in Memorizing, together with Some Discussion of the Technique of Memory Experimentation. *Am. Jour. Psy.*, April 1907, Vol. XVIII, 206-238.

Bolton, T. L. The Growth of Memory in School Children. *Am. Jour. Psy.*, April 1892, Vol. IV, 362-380, and charts.

Book, W. F. Psychology of Skill. *U. of Mont. Studies.* 1908, 188 pp.

Genesis and Development of Conscious Attitudes. *Psy. Rev.*, 1910, 381-398.

Rôle of the Teacher in the Most Expeditious and Economical Learning. *Jour. Ed. Psy.*, 1910, 183-199.

Breese, B. B. On Inhibition. *Psy. Rev.*, Monog. Sup., 1899-1900, Vol. III, No. 1, 1-65.

Bryan, W. L. On the Development of Voluntary Ability. *Am. Jour. Psy.*, 1892, Vol. V, 125-204.

Bryan, W. L., and Harter, N. Studies in the Physiology and Psychology of the Telegraphic Language. *Psy. Rev.*, 1897, Vol. IV, 27-53.

The Acquisition of a Hierarchy of Habits. *Psy. Rev.*, 1899, Vol. VI, 345-375.

Burnham, Wm. H. Illusions of Memory. *Scribner's Mag.*, 1892, Vol. XI, 185-195.

Memory Historically and Experimentally Considered. *Am. Jour. Psy.*, 1888-9, Vol. I, 39-90; Vol. II, 225-270, 431-464, 568-622.

Retroactive Amnesia. *Am. Jour. Psy.*, July-Oct. 1903, Vol. XIV, 382-396.

Training the Memory. *Nation*, Dec. 13, 1888, Vol. IV, 480-481.

Campbell, C. W. Economy in Learning. *N. Y. Teach. Mon.*, Vol. XIV, 1912, 1-34.

Cleveland, A. J. The Psychology of Chess and of Learning to Play It. *Am. Jour. Psy.*, 1907, Vol. XVIII, 296-308.

Colegrove, F. W. *Memory.* Holt and Co., N. Y., 1900, 369 pp.

Colvin, S. S. *The Learning Process.* Macmillan, 1911, 336 pp.

Coursault, J. H. *The Learning Process.* Tech. Coll. Cont. to Ed., 1907, 99 pp.

Couver, J. E., and Angell, F. General Practice Effect of Special Exercises. *Am. Jour. Psy.*, 1907, Vol. XVIII, 328-340.

Davis, Walter B. Researches in Cross Education. *Yale Psy. Lab. Studies*, 1898, Vol. VI, 6-50; second series, 1900, Vol. VIII, 64-108.

Dearborn, W. F. Experiments in Learning. *Jour. Ed. Psy.*, 1910, 373-388.

Dell, J. A. Learning of Sensible Material. *Jour. Ed. Psy.*, 1912, 401-406.

Ebbinghaus, H. *Über das Gedächtnis*. Leipzig, 1885, 169 pp.

Ebert, E., und Meumann, E. Über einige Grundfragen der Psychologie der Übungsphänomene im Bereiche des Gedächtnisses. *Archiv. für die Gesammte Psy.*, 1905, Vol. IV, 1-232.

Ellison, Louise. Acquisition of Technical Skill. *Ped. Sem.*, 1909, Vol. XVI, 49-63. Bibliog.

Fracker, G. C. On the Transference of Training in Memory. *Psy. Rev.*, Monog. Sup., 1908, Vol. IX, No. 2, 56-102.

Geissler, L., and Whipple, G. M. Recent Child and Educational Psychology. *Psy. Bull.*, March 1909, Vol. VI, 84-88.

Germann, G. B. The Formation of Habits. *N. Y. Teach. Mon.*, Dec. 1902, Vol. IV, 116-122.

Gordon, K. Meaning in Memory and Attention. *Psy. Rev.*, 1903, Vol. X, 267-283.

Hall, G. Stanley. *Adolescence*. Appleton, 1904, Vol. II, 451, 488*ff*.
Early Memories. *Ped. Sem.*, Vol. VI, 481-512.

Harvard Psychological Studies in Memory. *Psy. Rev.*, 1894, Vol. I, 34-38. *Psy. Rev.*, Monog. Sup., 1903, Vol. IV, 207-277.

Hawkins, C. J. Experiments on Memory Types. *Psy. Rev.*, 1907, Vol. IV, 289-294.

Henderson, A. M. A Study of Memory. *Psy. Rev.*, Monog. Sup., Dec. 1903, Vol. V, 1-88.
Also as book, Macmillan, 1903, 94 pp.

Jastrow, J. *The Subconscious*. Houghton, Mifflin, Boston and N. Y., 1906, 549 pp.

Johnson, W. Smythe. Researches in Practice and Habit. *Yale Psy. Lab. Studies*, 1898, Vol. VI, 51-104.

Judd, Chas. H. Practice without Knowledge of Results. *Psy. Rev.*, Monog. Sup., 1905, Vol. VII, No. 1, 185-198.

Kennedy, F. On the Experimental Investigation of Memory. *Psy. Rev.*, 1899, Vol. V, 477-499.

Kirkpatrick, E. A. An Experimental Study of Memory. *Psy. Rev.*, 1894, Vol. I, 602-609.

Kuhlmann, F. The Place of Mental Imagery and Memory among Mental Functions. *Am. Jour. Psy.*, July 1905, Vol. XVI, 337-357.

On the Analysis of the Memory Consciousness. *Psy. Rev.*, Vol. XIII, Sept. 1905, 316-348; *Am. Jour. Psy.*, Vol. XVIII, Oct. 1908, 389-420; Vol. XX, April 1909, 194-218.

Normal Illusions of Memory. *Am. Jour. Psy.*, 1905, Vol. XVI, 389-398.

Present Status of Memory Investigation. *Psy. Bull.*, 1908, Vol. V, 285-293.

Lakenan, Mary E. Whole and Part Methods of Memorizing. *Jour. Ed. Psy.*, Apr. 1913, 189-198.

Libby, W. Experiment in Learning Foreign Language. *Ped. Sem.*, 1910, 81-96.

Lindley, E. H. Some Mental Automatisms. *Ped. Sem.*, Vol. V, 1897, 41-60.

Meumann, E. *The Psychology of Learning.* Trans. of 3d ed. by J. W. Baird. Appleton, 1913, 393 pp.

Vorlesungen. See Index.

Meyerhardt, M. V. Economical Learning. *Ped. Sem.*, June 1906, Vol. XIII, 145-185.

Müller, G. E., and Pilzecker, A. *Experimentelle Beiträge zur Lehre von Gedächtnis.* Zeit. f. Psy. u. Physiol. d. Sinnesorgane, 1900, 300 pp.

Müller, G. E., and Schuman, F. Experimentelle Beiträge zur Untersuchung des Gedächtnisses. *Zeit. f. Psy. u. Physiol. d. Sinnesorgane*, 1894, Vol. VI, 81-190; 257-339.

Netschajeff, A. *Über Memorieren.* Reuther, Berlin, 1902, 39 pp.

Offner, M. *Das Gedächtnis.* Reuther, Berlin, 1909, 238 pp.

Ogden, R. M. Memory and the Economy of Learning. *Psy. Bull.*, 1904, Vol. I, 177-184.

Ordahl, Louise E. Consciousness in Relation to Learning. *Am. Jour. Psy.*, 1911, Vol. XXII, 158-213.

O'Shea, M. V. Child and Educational Psychology. *Psy. Bull.*, March 15, 1909, Vol. VI, No. 3, 73-77.

Pillsbury, W. B. Effects of Training on Memory. *Ed. Rev.*, 1908, Vol. XXXVI, 15-27.

Pyle, Wm. H. Retention as Related to Repetition. *Jour. Ed. Psy.*, 1911, 311-321.

Radestock, Paul. *Habit.* Heath, Boston, 1902, 117 pp.

Radossawljewitsch, P. R. *Das Behalten u. Vergessen bei Kindern u.*

Erwachsenen nach experimentellen Untersuchungen. Nemnich, Leipzig, 1907, 197 pp.

Rowe, Stuart H. *Habit Formation.* Longmans, 1909, 308 pp.

Shaw, J. C. Test of Memory in School Children. *Ped. Sem.*, Oct. 1896, Vol. IV, 61-78.

Sleight, W. G. Memory and Formal Training. *Brit. Jour. Psy.*, 1911, 386-457.

Smith, T. L. On Muscular Memory. *Am. Jour. Psy.*, July 1896, Vol. VII, 453-490.

Smith, W. G. The Place of Repetition in Memory. *Psy. Rev.*, 1896, Vol. III, 21-31.

The Relation of Attention to Memory. *Mind*, 1895, N. S., Vol. IV., 47-74.

Starch, D. Periods of Work in Learning. *Jour. Ed. Psy.*, 1912, 209-213.

Stern, W., and Clara. *Erinnerung, Aussage und Lüge in der Ersten Kindheit.* Barth, Leipzig, 1909, 162 pp.

Study of Memory, Class of 1910, Fitchburg Normal, 28 pp.

Swift, E. J. Acquisition of Technical Skill in Typewriting. *Psy. Bull.*, 1904, 295-305.

Beginning a Language. Houghton, Mifflin, 1906, 411 pp.

Psychology and Physiology of Learning. *Am. Jour. Psy.*, 1903, 200-251.

Mind in Making. Scribner's, 1908, 329 pp.

Tait, W. D. Effect of Psycho-physical Attitudes on Memory. *Am. Jour. Psy.*, Apr.-May 1913, 10-37. Bibliog.

Educational Psychology. Chap. 8, 80-93.

Thorndike, E. L. Memory for Paired Associates. *Psy. Rev.*, 1908, Vol. XV, 122-138.

The Effect of Practice in the Case of a Purely Intellectual Function. *Am. Jour. Psy.*, 1908, Vol. XIX, 374-384.

Thorndike, E. D., and Woodworth, R. S. The Influence of Improvement in One Mental Function upon the Efficiency of Other Functions. *Psy. Rev.*, 1901, Vol. VIII, 247-261.

Winch, W. H. Immediate Memory in School Children. *Brit. Jour. Psy.*, 1904-5, Vol. I, 127-134; 1906-7, Vol. II, 52-57.

Transfer of Improvement in Memory. *Brit. Jour. Psy.*, 1910-11, 386-405.

Woodworth, R. S. The Accuracy of a Voluntary Movement. *Psy. Rev.*, Monog. Sup., Vol. III, No. 2, 1-114.

The Causes of a Voluntary Movement. Studies in Philosophy and Psychology by Former Students of Charles Garman. Boston and N. Y., 411 pp. Chapter 12.

Number Forms

Calkins, M. W. *Am. Jour. Psy.*, Vol. V, 269-271.

Galton, Francis. *Inquiries into Human Faculty.* Section on Number Forms. Macmillan. $4.00.

Hornbrook, Adelia R. Pedagogical Value of Number Forms. *Ed. Rev.*, May 1893, Vol. V, 467-480.

Krohn, Wm. O. Pseudochronesthesia. *Am. Jour. Psy.*, Vol. V, 20-38. (Historical résumé and bibliography; good.)

Patrick, G. T. W. Number Forms. *Pop. Sc. Mo.*, Feb. 1893.

Phillips, D. E. Genesis of Number Forms. *Am. Jour. Psy.*, July 1897, Vol. VIII, 506-527. (Good.)

For studies in the correctness of testimony both in children and adults, *see* especially the *Beiträge zur Psychologie der Aussage*, edited by Stern, which contains little but this. Stern also has a brief article in English, *Am. Jour. Psy.*, 1910, 270-277, and Whipple one in *Psy. Bull.*, 1909, 153-170. Hugo Münsterburg's "On the Witness Stand" gives a popular but exaggerated account. Claparede also has a good popular account in *The Strand*, Sept. 1907. There is little in English.

CHAPTER IX

IMAGINATION

Observations

1. Collect instances in which a child's dream has created a lasting fear. Be sure that the fear did not exist previous to the dream. Collect instances where the dream created pleasure. Are such cases likely to be as common as the other? Why?

2. Observe in some one child whether or not this order is followed in the growth of imagination:

(1) Recalling and telling some experience of his own.

(2) Listening to stories told him.

(3) Inventing new stories himself.

3. Collect instances of the personification of inanimate objects. Did the children believe the object to be alive or not?

4. If you know of any case of an imaginary playmate, describe it fully, noting especially the age of the child when it began; how long it lasted; sex of child and of playmate; whether father or mother had such a playmate.

5. Collect statistics from school children on the following points. Get the age, sex, and grade of each child on his paper. In getting such data, to secure free utterance it is a good plan to tell the children not to put their names on their papers.

(1) If you could be to-day just what you want to be, what would you choose? Why?

(2) What do you want to be when you are grown up? Why?

Various sensations leave their traces on the baby's

brain, and as persons and objects move about him, he learns by degrees to connect their various aspects with each other, that is, he learns to perceive objects instead of merely receiving sensations. **Memory and imagination** Next, after he perceives objects as wholes, or while he is learning so to perceive them, comes recognition of them, and finally distinct memory images of them and desires for them when they are absent. Thus the baby arrives at a consciousness, though still vague and imperfect, of his past as well as of his present. He is no longer confined to a now, but looks backward to a then.

As his memory images become more stable, they also become freed from definite time and place associations. His experiences with chairs, tables, father and mother, and so on, have been so numerous that his image of a chair or table is not of his use of it at some one time and place, but of it in an indefinite time and place setting. He *may* have the definite setting, but he *need* not. In this way, the memory images become more flexible and subject to his will, and presently we find him making alterations, picturing himself as doing something this morning that he has not done for a month; making little plans of what he will do after dinner, and in such ways showing his power to manage his images. Then suddenly he becomes conscious of his power, and forthwith launches boldly out into a riotous sea of imaginings. Sometimes, indeed, he becomes swamped, or he mistakes his buoyant fancies for the dry land of facts, but by degrees he learns to control them, and to see their limitations.

At first, however, his new combinations are very inconspicuous, and more or less accidental. Perez thinks that they are first formed spontaneously, especially in sleep. Some slight disturbance of the circulation, or change in the brain, may lead to the establishment

of new connections — connections which cause new, grotesque, or pleasing mental combinations. I think we may safely say that the growth of the association fibers in the first months of life would lead to such new combinations, without any effort of will on the child's part. These spontaneous combinations will be found, though to a less degree, as the child grows older, and doubtless give suggestions for the voluntary combinations that the child begins to form between the second and third years. There can be little question that such combinations do occur in dreams, and that they seriously affect the waking life of many children. Mr. James gives a dream of his little girl as illustrative. She woke with a scream, saying that a dog had bitten her, and for months afterward she had spasms of terror at the sight of a dog, although up to that time she had liked them. I myself have a little friend who awoke, crying that an elephant was in the room and was going to eat her. Her mother said that for weeks she would not go into the room alone, even in the daytime, and even after six months she would not sleep there. If such occurrences are at all common, we can see how easily a child can live in a world wholly different from that known to us, and how, if his images in sleeping life are vivid enough, he may confuse them with reality. There seems to be little that one can do with such an unfortunate dream except as far as possible to make the child realize that it was only a dream and nothing to be afraid of.

Spontaneous new combinations

The systematic forming of new combinations by the child occurs first in listening to stories, but this does not come until after he has learned to tell little stories of his own life — what he has seen on his walk, what he did at grandma's, and

Systematic forming of new combinations

so on. He forms vivid images of these stories, as is shown by his insisting upon the same words and facts in the story every time they are told.

Only after this does he begin to invent stories of his own, but once started, he carries his story-telling to great lengths. The stories, like all his other fancies, are improbable and inconsistent to us, but not so to him, with his narrow experience. There is nothing incredible to him about the hole in a stone being the abode of fairies or about living in the water with the fish, and so he both accepts and invents fairy tales and myths with equanimity. As his experience widens and he learns more of the world about him, his wild imaginings give way to others that are more in agreement with fact, and so less conspicuous.

It may be partly true, also, that a child's fancies are so unbridled because his perceptions are indistinct, and thus he can read into them whatever he pleases without seeing any discrepancy with what is before him. In this connection it is worth noticing that the same child who can be so wildly imaginative finds great difficulty in framing a clear image from a description. He has not the power of concentration necessary for this.

There seems to be at times a real illusion in these fancies. The child will lose himself in them for the moment. The fancy is so real and divides from the object itself so gradually that often he cannot say where one ends and the other begins. He always starts with some actual object and proceeds to adorn it with his fancy, usually giving it qualities suggested by its likeness to other things.

Personification

As persons interest children most, they tend to personify all objects. The number of pretty and pathetic illustrations of this is infinite. The stupid letters of the alphabet are made into persons,

and the child talks to "dear old W," L is sitting down, and F and H are facing each other and talking.

The most prolonged case of such personification is given by Miss M. C. Whiting. Each number up to 12 had a distinct personality for her, and the various combinations of them in arithmetic made the subject most fascinating. She began this at the age of eight, and continued it for four years, taking it for granted that other people thought in the same way. The various combinations are made by the numbers acting in various ways, thus: 8 is so angry that she puts thoughtless 5 into 13. Here he stays until kind 9 rescues him and helps him into 14. 2 helps 6 and forces him into 12, a kind of prison. 8 finds 6 here, and puts him into 14, which is pleasant but beneath his dignity. 7 is already there by the aid of 2, and 8 hurls him into 15, a dungeon. 5 had already got himself here by the unintended moves of 3, but he persuades 4 to pity him and put him into 20, a most desirable station; and so on to 12x12.

Jean Ingelow tells us that when she was a little girl she was sure that stones were alive, and she felt very sorry for them because they always had to stay in one place. When she went walking she would take a little basket, fill it with stones, and leave them at the farthest point of the walk, sure that they were grateful to her for the new view. Another little girl thought that the leaves were alive, and autumn was a mournful time to her because the leaves all had to die. *Moving* things are likely to be personified, especially if they are noisy. Machinery, engines, and steamers are terrific personalities to the little child. But he also personifies his moving toys, his ball and his hoop. Even a sliding cushion was given life by one small boy. It seems odd to us that children should think of such things as *growing*, but a goodly

number of them do. Naturally enough, children attribute *solidity* to all objects at first, and so we find them trying to pick up the sunbeams. One little girl wants to wash the smoke and get it nice and white; and another wants to see the wind. When the wind was blowing strongly toward a neighboring town, one little child said he would like to go too because there must be so much wind there.

Along with this personifying of all objects is the tendency to look upon them all as made for the use of people or even of the child. One little girl thought that the flowers opened to please her, and that the sun came out to light her. It is very difficult in all such cases to know how far a child is accepting literally the figurative statements of other people, and how far he is imagining.

It is equally hard to draw the line between imagination and reason. Thus, if a child sees a certain object, his fancy at once forms pictures of how the object came to be what it is. For example, one little child met a lame tramp on his walk and at once began to tell his mother that the tramp had been "riding on a big high horse, and the horse had jumped and thrown him off and hurt his leg." Another little fellow saw the bumblebee industriously buzzing in the window, and told his mother that it was asking for a lump of sugar. Then he addressed the bumblebee and told him that the sugar would give him cramps. The transition from fancy to reason is clear in the case of the tramp. The picture of the horse is the child's explanation of how it might come about that the tramp was lame. The induction does not seem to be different in nature from the working hypothesis of the scientist.

Imagination and reason

It is also often difficult to distinguish between the playfulness of the imagination and lying. A child will sometimes come home and reel off long stories

about what he has been doing and seeing, which have little or no truth in them. This tendency will last for months at a time. The thing one should look for in such a case is the motive. Does the child *intend* to deceive you, or is he just playing with images, and asking you to play too? One way to find out is to respond to his story with some pretended doings of your own, confessing at the end that it was only play, and asking him if his story was not also. If in some way like this he is reminded that his ideas are not like the facts, he will usually outgrow the tendency. Only the intention to deceive is dangerous, and this we shall speak of shortly.

Imagination and lying

Loneliness, distance, and mystery are great stimulants to a child's fancy. Probably most children have fictitious characters with whom they play at times, but the imaginary playmate reaches its greatest development in the child who plays alone. It is not uncommon to find that such a child has created for himself an invisible companion who is with him most of the time, and who remains in existence for two or three years. This companion has a name and a definite appearance and is a source of much comfort, as well as, frequently, the alleged reason for much misconduct. "Bokman made me do that, mamma," is the reason sometimes given by one little girl that I know. Or, "Bokman is wearing her blue dress; can't I wear mine?" It is frequently the case that the tendency to create such companions is hereditary. Usually when a child begins school, or gets absorbed in outside things, the companion fades away, but I know of one case in which it has persisted up to middle life.

Imaginary playmates

The distant world, the world beyond the hills, or at the end of the rainbow, or above the clouds, is the source of many childish wonderings and imaginings. I remember

that in that charming story, *The Golden Age*, there is an account of one picture in a book that was a source of constant questionings by the children. There was a hill beyond which church spires could be seen, and ships were sailing around a bend of the river into the city. One day in a friend's house they found a book with pictures of the town. What joy was theirs really to see what they had wondered over so long!

Distance and mystery

The degree to which these fancies may be carried, and the amount of reality necessary to bolster up the imagination, varies greatly. Sometimes a child may be urged to greater flights by a little make-believe on our parts. For instance, in playing store with a little girl of five I said I wanted some blue ribbon. She answered that they were out of it, but I pointed under a box cover and said, "Why, no; there is some." The box cover was green. "No," she said, "that ribbon is green." I persisted that there was blue ribbon under the cover, and took the cover away, pointing to the brown couch beneath, and saying, "See, there is blue ribbon." "No," she said, "that is brown ribbon. Don't you see it is brown?" But presently, as I still persisted, she accepted my view, pretended there was blue ribbon, and taking it up—a purely imaginary ribbon—brought it to me. The relation of invention to imagination here is most interesting.

Vividness

So far we have been discussing what may be called fancy. Chance association and personal feeling control the mind, and the child is more or less conscious of the unreality of his mental rovings. We find a different state of affairs, however, when we turn to invention. The account of this will follow Baldwin. Let us go back, for the beginning of the child's inventions, to his imitations, and study the method

Invention

of persistent imitation. In repeating a movement again and again, a child is constantly omitting some movements, putting in others, and so learning new ones. Now, just in proportion as a child gets skill in reproducing the copy that he set out to imitate, his attention can play about the movements he is making and introduce untried combinations, which result in something new or advantageous to himself. These changes may be accidental at first, but the sense of mastery that they give is a strong incentive to trying others, and so there is constant experimenting, modifying of old situations and stories, and intense enjoyment of the results. Baldwin gives as illustrative of the process an invention of Helen's. She began by copying with her blocks a church from her picture book. When she had it partly done, she saw that it could be altered a little and finished as an animal, which she forthwith did. This is typical of the inventive process, and is an important step in the child's development, because it teaches him that he has control over objects—that he is not limited to the mere imitation, but can make a new world of his own. From the teacher's standpoint, the close connection between this creation and imitation is important to note. The most imitative child may be the most imaginative.

When a child has made such an invention, the next thing is to show it to an admiring world, to get social approval, and this also is typical of all minds. If others will not accept his wonderful creation, if they criticize or laugh at it, he is forced to modify his enthusiasm of it—to change it so that it will meet with general approval and use. The possibility of using his invention in his relations with others is thus a child's final test of his creation, and a spur to new efforts. The desire to have control of the situation, or

to escape unpleasant surroundings, doubtless underlies this.

Many so-called lies illustrate the same point. Baldwin gives another example here. Helen was bringing some packages to him from the hall and became tired before they were all brought in. She brought them more and more slowly and finally stopped before him and said, "No more." Now, as she became tired, Baldwin says, the thought of her delight when the task was finished and of the praise she would receive from her father, became more and more prominent. With this was the consciousness that she would tell her father when she was through. From this consciousness it was a short step to the thought that by telling him at once that there were no more she would be praised and relieved. That is, simply to escape from an unpleasant situation she invented a situation which would give her the desired results, without any sense of wrongdoing. Many of the first lies of children, where they are not purely imaginative, are of this sort, and should be carefully dealt with, because they grow into deliberate lying. They usually occur like this one, because they are of use to a child in some way. The best way to deal with them must vary according to the disposition of the child. He must in one way or another learn that social disapproval always follows such an act, because if people generally lied, social life could not exist. On the other hand, when he has done any kind of wrong, the treatment of him should be such as to induce repentance instead of fear, so that the next time he does wrong he will not be tempted to lie to escape punishment. Where there are confidence and wise government, the lie problem will not be so pressing as where there are fear and too great restriction. To prevent lies, then, there should be cultivated most carefully in a child the courage to take

Invention and lying

the consequences of his acts, and the confidence that he will always be justly treated and understood.

Sex differences in adolescents

Brittain made a study of the imagination of nineteen boys and twenty-one girls between thirteen and twenty years of age. His study ran over six months, and involved a wide range of questions and observations, such as the favorite school subject, the character of their daydreams and of the poetry and stories written by them, the effect of natural phenomena, music, and art upon them, their favorite books and poems, the character of the story titles suggested by them, and the stories written by them under different conditions.

The points which stand out in his results are these: The boys specialize in their interests more than the girls do, and offer both the best and the worst cases of constructive imagination. Their daydreams are rarely of the past, and hunting, fishing, and work are the predominant subjects in them. About half of both boys and girls still like fairy stories. In the other tests it appears that the boys' interests are predominantly active, embracing such subjects as hunting, fishing, seafaring, and war, and they have a strong sense of practical humor. The girls' interests center largely about the emotions of pity and fear, their moral and social interests are stronger, their motor interests of a less strenuous sort, their sense of humor as great but more refined and fanciful, their leaning toward the mysterious stronger. Lobsien makes similar statements in his *Kind und Kunst.*

Finally we come to the most practical use of imagination that any of us can make — the planning of a career. Nearly eight thousand children have been asked what they would like to do when they are grown up, or what person they would like most to resemble, and what part

they would like to take in the life about them. The close connection between imagination and imitation is seen here. The occupations are necessarily chosen from the lives that the children know, and out of the whole list suggested the boys mention two thirds to three quarters of the entire number. As one girl puts it, "There are not many things for a girl to be."

Ideals, hopes, and ambitions

The following table shows the occupations mentioned most frequently. Where two figures are given, they show the variation between different reports; where but one, agreement or but one report.[1]

Occupation	Boys	Girls
Teacher	3– 4%	38–45%
Dressmaker		19–24
Milliner		19–24
Music teacher		6– 8
Musician		0¾
Artist		0– 3
Housekeeper		3
Nurse		0– 2
Servant		0– 6
Wife and mother		0¾
Missionary		0– 0¾
Factory hand		0– 0¾
Bookkeeper	0– 3	0– 2
Typewriter		0– 1
Clerk or stenographer		2–11
Trades (Taylor's estimate, 1,490 boys)—		
Engineer	11	
Carpenter	4	
Blacksmith	4	
Machinist	1	
Merchant, business man or storekeeper	18	0– 2
Farmer	6	
Minister	21	8
Doctor		
Lawyer		
Sailor	21	
Railroad man	21	

[1] The table is based on the figures of Taylor and Monroe, with some data from Chandler and Darrah.

This table represents the average for all ages, but we find certain changes in choice between seven and fifteen years of age that should be noticed. Thus, the choice of teaching varies from 41 per cent at seven years and 58 per cent at nine years to 20 per cent at eleven years. Among girls, milliner and dressmaker choices outnumber those of teaching at thirteen and fourteen years and only then, pointing to an increased interest in dress.

With boys, trades seem to be the most popular between seven and nine and clerkships between ten and twelve. The choice of a business career appears at eight, that of a sailor's life at nine, and both increase slowly, but steadily.

These variations in the choice of profession at different ages are shown in more detail in Mr. Jegi's table of two thousand eight hundred poor German children. The table is given in per cents.

Boys

Years.....	8	9	10	11	12	13	14	TOTAL NO. CHOOSING FATHER'S PROFESSION
Carpenter..	21%	26%	22%	22%	17%	10%	6%	
Merchant..	19	11	16	13	7	12	15	67
Bookkeeper	0	10	11	15	5	15	23	3
Farmer.....	13	12	9	15	9	10	18	14
Engineer...	3	11	8	9	20	10	10	14
Machinist..	2	4	2	4	7	18	23	4
Clerk.....	3	6	1	10	13	12	12	17
Fireman....	9	8	18	8	4	2	4	6
Sailor.....	2	7	9	4	12	6	12	1
Officer.....	3	9	10	6	5	10	8	2
Soldier.....	10	10	8	9	8	2	2	0

	Girls						
Years	8	9	10	11	12	13	14
Clerk	17%	22%	24%	19%	25%	35%	16%
Teacher	88	91	64	63	77	33	32
Dressmaker	27	91	36	57	48	63	21
Housekeeper	56	34	32	32	28	22	14
Music teacher	0	3	12	12	12	27	11
Milliner	8	7	4	10	10	8	9
Bookkeeper	1	0	4	12	3	7	22
Typewriter	0	2	2	8	3	7	11

The reasons for choice may be given as follows:

Reasons	Boys	Girls
Like it	18%	25%
Fitness for work	0	5
Money	24	15
Easy	4	6
Philanthropy	5	9
Parents' or relations' occupation pleasant	1	0
Demand for this work	3	0
Pleasant	4	7
Opportunity for travel	2	1

As Mr. Monroe gives the table it is:

Reasons	Boys	Girls
Like it	30%	44%
Money	44	24
Easy	12	14
Philanthropy	6	7
Parents' or relations' occupation pleasant	3	2
Miscellaneous or no answer	5	9

Both tables agree in emphasizing the importance of the child's liking and his desire to earn money in deciding his choice. Indeed, the desire to earn money is so prominent that we cannot but believe that our mercenary age is influencing our children far too much. It seems dreadful that as many children, not adults, but *children*,

should feel the need of earning money, as feel free to follow their own liking. Indeed, the most marked feature of all those observations is that so few of the children go beyond the range of the commonplace in their choice of a life work. The shades of the prison-house have already closed about them. They do not feel free and conscious that the world is theirs for the choosing. Most of them look forward to a life of hard work — household drudgery or ditch digging. Are they not loaded with the burdens of adult life too soon?

The money motive

Money is the strongest motive for choice at every age from seven up to fourteen, when the adolescent asserts himself and chooses a profession because he likes it, or because his father or uncle is so and so.

Mr. Jegi's figures of the German children, however, show that most of them, while choosing a humble profession, choose it because they like it, and that the money motive decreases instead of increasing with age.

The desire to earn a living appears at the age of seven, and this motive, growing in definiteness and determining the occupation, such as teaching, because it gives good pay, increases until it makes 25 per cent of the choices at the age of twelve.

Other motives

There is also a growing appreciation of the disagreeable side of all work, and of the demand for each sort.

Altruistic motives are not prominent until the eleventh year, when 10 per cent of the choices are determined by the desire to help support the family. At twelve, plans to help the poor, to convert the heathen, and like reasons, appear, and rise to their highest point at fourteen.

In observations upon four hundred and fifty children from kindergarten through eighth grade, Misses Sheldon and Hamburgher found a marked difference between the character of the wish for the present,

and for the future when they were grown up. Contrary to what we should expect, 16 per cent chose the improbable for the present but only one-eightieth of one per cent chose it for the future. The contrast is very funny in some cases. Thus, one child, if she could have her wish, would be a rose in a garden to-day; but when grown, a teacher; another would be a bird now, but a dressmaker when grown; one boy of ten would be (of all things!) an angel now, but a doctor by-and-by.

Present and future desires

It was also quite noticeable that when asked what they would choose for themselves and for another, they chose the more probable thing for self and let their fancy free on the other—bedroom slippers for self, and a diamond ring for the mother. Or is it possible that to the child the two things are on the same plane of values?

Why should a child choose the improbable for to-day, and become so matter-of-fact over the future? Is it because the futility of to-day's choice appeals to him so that he lets his fancy roam? It would be worth while to get returns from more children to see whether or not this difference is constant, and whether it is more marked with the older children than with the younger.

The character of the hopes which control childish acts is seen from another standpoint in an inquiry into children's motives for planting seeds. Among the boys, materialistic purposes increased from 56 per cent at eight to 75 per cent at fourteen, and in the girls from 47 per cent at eight to 57 per cent at fourteen. Between eight and fourteen, the æsthetic idea decreased among the boys from 50 per cent to 28 per cent and among the girls from 54 per cent to 44 per cent. Altruistic motives fluctuate in the boys, from 10 per cent at eight and 25 per cent at twelve, to

Æsthetic and material ideas

15 per cent at fourteen. In the girls, on the other hand, they increase steadily, from 18 per cent at eight to 60 per cent at fourteen.

The child's ideal

Considering the ideal person whom the child would be, we find that with little children his traits are borrowed chiefly from father, mother, or friend, and very seldom from literature or history; while with sixteen-year-old boys and girls historical characters lead, followed by those from literature, and a very few from among friends or parents. Washington and Lincoln are the heroes of both boys and girls, and the girls' ideals as a rule emphasize qualities essentially masculine.

The table below shows the most common ideal attributes and their influence at different ages, in per cents.

	7 YEARS	12 YEARS	15 YEARS
Goodness	25%	23%	22%
Goodness to self or class	27	4	0
Truth and honesty	4	9	10
Appearance	3	3	4
Striking quality	12	1	0
Feminine accomplishments	12	1	0
Intellectual power	3	10	12
Bravery and adventurous qualities	5	19	13
Discoverer or inventor	2	1	0
Patriotism	0	6	10
Leadership	4	13	18
Wealth	10	0	2

The studies by Chambers, Goddard, Hill, and Brandell, who asked Barnes's question of American, German, and Swedish children, bring out in a striking way both the similarities and differences in the child mind. The question asked was: What person of those whom you have seen, thought of, heard of, or read about would you most like to resemble, and why?

Among the German and Swedish nine-year-old children parents were most commonly chosen, by 40 per cent of

the Swedes and 26 per cent of the Germans, but by only 17 per cent of the Americans. This percentage steadily decreases with age. In all the studies few children choose the teacher, and a larger percentage of girls than of boys choose acquaintances. From parents and acquaintances there is a transition to historical and public characters in both boys and girls, the Swedish and American children leading in the percentage chosen and in the variety of characters, while the German children from the *Volksschule* have the narrowest range and the smallest number of choices. Contemporary public characters increase in number with the age of the children. In America the most frequent choice of an historical or public character is George Washington; in Sweden, Gustavus Adolphus; in Germany, Emperor William. The girls choose more characters from fiction and religion than the boys do, and more from the opposite sex, though this is less true among the German children than the others. The American children average about 5 per cent and the Swedish 6 per cent in choice of Biblical characters, whereas the German, English, and Scotch children studied range from 7 to 18 per cent. This, it is supposed, is due to the religious instruction in the schools, and Hill remarks that perhaps if this same question were asked of American children in Sunday school a much larger percentage of Biblical characters would be chosen.

The reasons for choosing the given character differ considerably with nationality and sex. The most common reason is that the ideal person is good and kind, but this diminishes with age. Material possessions apparently attract less than 1 per cent of the Swedish children; 2 to 7 per cent of the American; 14 per cent of the German boys and 5 per cent of the German girls;

10 per cent of the London boys and 14 per cent of the London girls. Again, only 2 and 1 per cent of Swedish boys and girls long for social position, honor, and fame, as against an average of about 16 per cent of American and 20 per cent of London children. But 27 per cent of Swedish boys and 33 per cent of the girls mention intellectual and artistic qualities, 2 per cent of the German, 6 per cent of the London and less than 5 per cent of the American. In all studies, these increase with age, and physical characteristics are little referred to at any age. The percentage of girls is larger than that of boys. They also choose moral qualities more frequently, while the boys choose frequently social, military, and political qualities.

Adler emphasizes strongly the fact that the attributes desired by any child or adult are those seen in the person who is known to be most powerful, and that in the child's life this person is usually the father. Again, if the child feels himself weak in any special way, he will make a special effort to assume or acquire the lacking trait or possession, and thus he becomes tense, adaptable, sensitive, and may become nervous or neurotic, capable, or even talented in directions in which he is by nature weak. Whether he fails or succeeds depends upon many incalculable factors, but it seems necessary to assume, as Adler apparently does not, that the defect cannot be too serious. A person with sensitive eyes or ears, for instance, might become a painter or a musician, but a deaf child or blind child cannot. Adler does not seem to allow sufficiently for the normal person with talent or genius, but almost leaves us to infer that unless there is a feeling of inferiority there will be no striving and no attainment. While this includes many cases it does not cover all.

The more general question of what children would

choose to have for self and others, brought this result:[1]

Choice	Self	Others
Concrete things	$56\frac{2}{3}\%$	$70\frac{7}{8}\%$
Knowledge	$8\frac{2}{3}$	$\frac{2}{15}$
Health	$5\frac{1}{9}$	$3\frac{1}{3}$
Companionship	$8\frac{4}{9}$	$3\frac{7}{9}$
Happiness	$7\frac{7}{9}$	$4\frac{8}{12}$
Virtue	$3\frac{1}{9}$	$2\frac{2}{3}$

With age there was a slight increase in the choice of abstract qualities.

Use and abuse of imagination

Now is it not a pity that children and young people should be on the whole so prosy and confined to real life as these children are? We hear a great deal about the abuse of imagination, the danger of daydreams and castles in Spain, and the moral obliquity involved in presenting fairy tales and myths to children. There is, of course, a real danger here, lest in playing with ideas a child forget realities, but in view of this collection of ideals borrowed so directly from the everyday life of thousands of children, the danger of our becoming a nation of dreamers does not seem to be nearly as imminent as that of our becoming a nation of money lovers and materialists, satisfied with present conditions. Will children with such ideals ever become creators? Will they turn out to be artists, poets, inventors, or even signal successes in the conduct of any large enterprise?

Instead of abusing the imagination by exercising it too much on useless things, we are abusing it by not employing it to raise and elevate our lives from year to year. There is no stronger power for good than a

[1]Misses Mary L. Sheldon and Rae Hamburgher's unpublished data from four hundred and fifty children in the Chicago schools. The children were all from the "poorer districts."

vivid and noble ideal. It is the air and water for the beautiful character that grows from the soil of prosaic surroundings. Even putting the question on practical grounds, no business can be successfully conducted unless the man at the head can imagine clearly the consequences of this or that move. He must be able to picture how his customers will like this new fabric; how he can best introduce it, and so on. Imagination, in short, is the pattern of the web of life. It is the shaping force without which the universe would be a chaos. We should say, then, that abuse of the imagination is possible only when images do not finally turn back into our life and change it in some way. With this one limitation, we cannot encourage the free use of images too much...

Training of imagination

We have already seen that imagination is based upon memory images. In proportion as those are clear and distinct, will the material of imagination be easy to manipulate. There is, however, no reason for using this material and so setting imagination to work, unless a child's curiosity is roused by something that he does not understand. When he asks himself a question and sets about finding the answer, imagination begins to work, and it may end in an invention like the telephone, a theory like the nebular hypothesis, or a picture like the Sistine Madonna. The necessary thing in all cases is the arousing of a keen curiosity or interest which is permanent enough to keep the questioner at it until he has an answer. To cultivate the imagination, therefore, cultivate far-reaching enthusiasms and interests.

REFERENCES

IMAGINATION

Adler und Fortmuller. *Heilen und Bilden*, 1913, 186 pp.

Alexander, H. B. Observations on Visual Imagery. *Psy. Rev.*, 1904, Vol. XI, 319-338.

Baird, J. W. Memory and Imagination (Summary). *Psy. Bull.*, 1911, 243-253.

Baldwin, J. M. (ed.). Bibliography on Imagination. See *Dict. of Phil. and Psychol.*, Vol. III, 1067-1069. Macmillan, N. Y., 1906.

Barnes, Earl. Children's Ideals. *N. W. Mo.*, Oct. 1898, 91-93; *Ped. Sem.*, 1900, Vol. VII, 3-12.

Bentley, I. M. The Memory Image and its Qualitative Fidelity. *Am. Jour. Psy.*, October 1899, Vol. XI, 1-48.

Binet, Alfred. Mental Imagery. *Fort. Rev.*, 1892, Vol. LVIII, 95.

Blow, S. E. *Symbolic Education.* Appleton, N. Y., 1895, 251 pp.

Bolton, T. L. A Genetic Study of Make-Believe. *Jour. of Phil., Psy. and Sci. Meth.*, 1908, Vol. V, 281-287.

Book, W. F., *Psychology of Skill.* U. of Montana Studies, 1908, 188 pp.

Brittain, H. L. A Study in Imagination. *Ped. Sem.*, 1907, Vol XIV, 137-207.

Burnham, W. H. Individual Differences in the Imagination of Children. *Ped. Sem.*, 1893, Vol. II, 204-225.

Carter, M. H. The Kindergarten Child after the Kindergarten. *Atlantic Mo.*, 1899, Vol. LXXXIII, 358-366.

Chalmers, L. H. Studies in Imagination. *Ped. Sem.*, 1900, Vol. VII, 111-123.

Chandler, K. A. Children's Purposes. *C. S. M.*, 1897-98, 136-139.

Clapp, E. R. Dependence upon the Imagination of the Subject-Object Distinction. *Jour. of Phil., Psy. and Sci. Meth.*, 1909, Vol. VI, 455-460.

Colvin, S. S. Child's World of Imagination. *Ele. Sch. Teach.*, Vol. VI, 1906, 327-342.

Colvin, S. S., and Meyer, I. F. Imaginative Elements in the Written Work of School Children. *Ped. Sem.*, 1906, Vol. XIII, 84-93.

Development of Imagination. *Psy. Rev.*, Monog. Sup., 1909, No. 44, 85-126.

Compayré, G. *Intellectual and Moral Development of the Child.* Chapter on Imagination. Appleton, N. Y. $1.50.

Darrah, E. M. Study of Children's Ideals. *Pop. Sc. Mo.*, 1898, 88-98, Vol. LIII.

Davidson, John. Educational Meaning and Function of Myth. *Paid.*, 1907, 98-115.

Davies, E. Training of the Imagination. *Contemp. Rev.*, 1869, Vol. XII, 25-37; *Littell's Liv. Age*, 1869, Vol. CIII, 120-138.

Dearborn, J. V. A Study of Imaginations. *Am. Jour. Psy.*, 1898, Vol. IX, 183-190.

Dugas, L. *L'Imagination.* Doin, Paris, 1903, 350 pp.

French, F. C. Mental Imagery of Students. *Psy. Rev.*, 1902, Vol. IX, 40-56.

Galton, Francis. *Inquiry into Human Faculties.* Section on Images. Macmillan. $4.00.

Gilbertson, G. N. Swedish Study in Children's Ideals. *Ped. Sem.*, Mar. 1913, 100-106.

Goddard, H. H. Ideals of a Group of German Children. *Ped. Sem.*, 1906, 208-220.

Hall, G. S. Children's Lies. *Ped. Sem.*, June 1891, Vol. I, 211-218.

Herts, A. M. *The Children's Educational Theatre.* Harper, N. Y., 1911, 150 pp.

Hill, David S. Children's Ideals. *Ped. Sem.*, 1911, 219-231.

Hursh, S. B. Children's Hopes. *C. S. M.*, 1895-6, 256-259.

Jastrow, J. Eye Mindedness and Ear Mindedness. *Pop. Sc. Mo.*, May to Oct. 1888, Vol. XXXIII, 597-608.

Jegi, J. I. Children's Ambitions. *Trans. Ill. Soc. C. S.*, 1899, 121-144.

Lay, W. A. Mental Imagery. *Psy. Rev.*, Monog. Sup., No. 7, May 1898, Vol. II, 59 pp.

Lewis, H. K. *The Child: His Spiritual Nature.* 38-42. (Inventions.) Macmillan, N. Y. $2.00.

Libby, W. Imagination of Adolescence. *Am. Jour. Psy.*, 1908, Vol. XIX, 249-252.

McMillan, Margaret. *Education through Imagination.* London, 1905, 196 pp.

Meakin, Frederick. Mutual Inhibition of Memory Images. *Psy. Rev.*, Monog. Sup., No. 17, Jan. 1903, Vol. IV, 235-275.

Meumann, E. *Vorlesungen.* Englemann, Leipzig, 1911. 2d ed. Vol. I, 518-540.

Monroe, W. S. Vocational Interests. *Education*, Vol. XVIII, 259-264.

Moore, C. S. Control of Memory Image. *Psy. Rev.*, Monog. Sup., 1903, Vol. IV, 277-306.

Partridge, Geo. E. Reverie. *Ped. Sem.*, 1898, Vol. V, 444-474.

Perky, C. W. Experimental Study of Imagination. *Am. Jour. Psy.*, 1910, 21, 422-452.

Price, Nancy. *Behind the Night Light.* Murray, Lond., 1912, 50 pp.

Queyrat, F. *Les jeux des enfants.* Alcan, Paris, 1905, 161 pp.

L'imagination et ses variétés chez l'enfant. Alcan, Paris, 1893, 162 pp.

Ribot, T. *Essay on Creative Imagination.* Open Court Pub. Co., 1906, 370 pp.

Richmond, Mary E. Early Training of Imagination. *Child Life,* 1904, 193-198.

Royce, J. The Psychology of Invention. *Psy. Rev.,* 1898, Vol. V, 113-144.

Secor, N. B. Visual Reading. *Am. Jour. Psy.,* Vol. XI, 225-236.

Slaughter, J. W. Behavior of Mental Images. *Am. Jour. Psy.,* 1902, 526-549.

Smith, T. L. Psychology of Day Dreams. *Am. Jour. Psy.,* Oct. 1904, Vol. XV, 465-488.

Sully, James. *Studies of Childhood.* Chapter on Imagination. Appleton, N. Y. $2.50.

Talbot, E. B. An Attempt to Train the Visual Memory. *Am. Jour. Psy.,* April 1897, Vol. VIII, 414-417.

Taylor, J. P. Preliminary Study of Children's Hopes. *Annual Rept. of Supt. of Ed. of N. Y.,* 1895-6, 992-1012.

Practical Aspects of Interest. *Ped. Sem.,* Vol. V, 1897-8, 497-511.

Thurber, C. H. What Children Want to Do when they are Men and Women. *Proc. N. E. A.,* 1896, 882-887. (Summary of Taylor.)

Tyndall, J. *Scientific Use of Imagination.* Appleton, 1881, 509 pp.

Vostrovsky, Clara. Imaginary Companions. *Barnes's Studies in Ed.,* 98-101.

Whiting, M. C. Individuality of Numbers. *Ped. Sem.,* 1892-3, 107-110.

Willard, Hattie M. Children's Ambitions. *Barnes's Studies in Ed.,* Vol. I, 1896-7, 243-253.

Wiltse, S. E. Mental Imagery of Boys. *Am. Jour. Psy.,* 1894, 144-148.

Winch, W. H. Relations between Substance Memory, and Productive Imagination in School Children. *Brit. Jour. Psy.,* 1911, 315-341.

See also indexes in the general studies, and studies of individual children.

CHAPTER X

Conception and Reasoning

1. Notice:
   (1) When the baby first connects sensations; for example, the milk with the bottle.
   (2) When he first compares objects; for example, one face with another.
   (3) When he first connects a present with an absent object; for example, the dress with the absent mother.
   (4) When he forms a sequence; for example, the sight of his cloak suggests going outdoors.
   (5) When he first adapts means to ends; for example, pulls the tablecloth to bring something within reach.
   (6) When he first asks a question. How old is he? What is it? Does he follow it with others? How long is it before questioning becomes common?

2. Question children from three to eight years old as follows:
   (1) What is the length of an hour, day, week, month, and year?
   (2) See whether they know how much longer the day is than the hour, the week than the day, and so on.
   (3) How much do they think that they can *do* in an hour?
   (4) At what age did they learn to tell time?

(5) At what age do they care to know the day of the month, the names of the months?

3. Ask school children to tell you what the things are that are named in Dr. Hall's list in the chapter on Perception, or in a similar list. These descriptions will show the imperfections in the children's sense experiences and the consequent imperfections in their concepts.

With the development of genetic psychology it is accepted as an unquestionable fact that the mental life is a gradual and unbroken growth from the cradle to the grave, as much as is the growth of the body. The infant mind must contain in the germ the possibilities of the highest reasoning. True, it needs the sunlight, air, and water of favorable surroundings to develop it, as any germ does, but it is waiting to be developed, except in the few unfortunates who are born with the possibility of only a slight development.

Conception, judgment, and reasoning have their roots in the first stimulus and the reaction to it, and are only better methods of adaptation to surroundings than those based merely on perception and knowledge of individual things. We have already seen that perception is very complex, involving factors of recognition and reaction on the basis of recognition. We tend to react to present stimuli, even if they be somewhat different from the old, as we did to the old, and when such a reaction works well, we identify the new thing with the old.

First consciousness of classes

In discussing perception it was stated that by the third week the sight of the breast called out movements toward it for nursing, and that from the third month on, recognition of objects increased very rapidly. It was noted that this was to a large extent due to organic memory, and not to the presence of memory images. At this stage,

therefore, a baby cannot compare a present with a past experience, and only with difficulty can compare two present experiences.

This first recognition goes into few details. Some strong impression appeals to the baby's senses, and any object that gives the same impression calls out the same reaction. Preyer's son showed a strong liking for white bottles of any sort, like his milk bottle. Babies at first usually treat all men as they do their father, unless there is some striking peculiarity. If the mother remains much with the child, she is kept in a class by herself, but otherwise it is not at all uncommon for the baby to act toward all women as he does toward his mother.

In such cases, there is a recognition by means of organic memory of certain prominent characteristics, and there is a responsive movement of some sort. The first concept is thus, according to Baldwin, an habitual response to a certain stimulus.

We may say confidently that the possibility of comparison is small at birth, for the various brain centers have then few fibers connecting them. During the first nine months, however, the brain increases more in size and in connections between its parts than at any other period of life, so that we may expect to find comparison by the ninth month, and in all probability considerably earlier.

The first comparisons

When we speak of comparison, we simply mean noting the relationships between two objects or ideas. The two things must both be included in one mental act. Even if two *objects* are compared, then it is evident that there must be at least enough memory to remember the first object while examining the second. Miss Shinn records the first memory and the first comparison at the same time, in the beginning of the third month, when her niece

studied her and her mother alternately, for some time, turning her head from one to the other and examining them both intently.

Perez gives what is clearly a case of comparison, although he does not seem to be sure of it, in describing an eight-months-old boy's experiences with two cats. The boy was playing with one cat when another cat of the same size and color entered the room. Suddenly the child caught sight of it and apparently could hardly believe his eyes. He stared at it and then at the first cat, his body tense with attention and astonishment. He examined the two until he became satisfied that they really were two different things, though so much alike.

As soon as a child begins to speak, we have certain and numerous evidences of the similarities that he is constantly seeing between objects. All white animals of a certain size are "lambies"; all black ones, "doggies." The hairless doll is "Grandpa." Men without beards are boys even to the four-year-old, and the ten-cent piece is a baby dollar.

We see comparison clearly when Mrs. Hall's child, at eight months, recognizes the real dog from the image on the mantel; when Preyer's boy, at about one year, compares his father's face with its reflection in the mirror; and in the case cited by Ribot, of the child who compared the ticking of the watch with that of the clock. We see here, as in the first class-consciousness, that only certain very obvious or interesting qualities strike the child's mind, and so his classification by those qualities seems to us very funny or very pretty. We should add, however, that where there is a strong interest, the comparisons of a four-year-old child will average favorably with those of an uninterested adult.

We have no data to show when a child first compares two *ideas* with each other.

We may best describe the baby's condition when comparison has fairly begun by summarizing Baldwin's account of the origin of the concept.

Origin of the concept

The child begins with an indefinite and vague whole, which is both particular and general, percept and concept. Take, for instance, the pet kitten, the child's first experience with cats. The individual and the class are to him the same at this point. He knows no class but the individual. But he meets now a big cat of a new color. He may not identify it with the first cat at all, but the chances are that he will. Percept and concept now begin to divide—the two individuals are alike in some ways, so that both are called cats, and different in others, so that one is called Tiger and one Tom. Tiger scratches, Tom does not; but both are soft and warm and both purr. So his idea of a cat is a purring, warm, soft animal, that may or may not scratch. The next cat he sees may lick his fingers, and so, with every successive experience some qualities may be left out and others put in only as possibilities, until there is but a small nucleus of qualities belonging to all cats, and a large fringe of other characteristics that may belong to any particular Tabby or Tom.

The amazing thing is that the baby learns so quickly to distinguish individuals from each other, and yet, at the same time, to put them together into one class, as things to eat, things to drink, rolling things, and so on. Experience is his only teacher here, but experience, reinforced by pleasure and pain and by the natural impulses and instincts of the child, is very powerful.

It is important to the baby's safety and comfort that he should learn thus speedily to distinguish and

associate. Take, for instance, the cats again. He likes the soft fur and warmth, but he gets scratched by Tiger. Now for a long time he may be afraid that all cats scratch, but if he learns that only Tiger scratches and Tom and Tabby do not, he gets the pleasure of playing with them and avoids the pain of Tiger's claws. That is, to state it generally again, a baby that learns most readily the qualities peculiar only to an individual and those common to a class, is the baby that is the most independent and the surest of safety.

Incompleteness of child's concepts

That the child's first concepts are incomplete is a foregone conclusion from what we have already said. His experiences with objects are necessarily limited; he cannot tell from the few people or houses or rivers that he has seen, which of their qualities are peculiar to them and which belong to all objects of their kind. When we add to this his imperfect observation and his small power of voluntary attention, we can see that correct concepts will be a late mental product. A child may have as wild an imagination as an adult, but an imagination that attends to universal and real qualities, as conception does, is obtained only by long experience and training.

The child's concepts are therefore too general in some cases and too particular in others. He does not put into the concept all the qualities that it ought to have, as in thinking that all white things are milk; or he puts in wrong ones, as in thinking that all rivers are dirty; or he combines both errors, as in thinking that blackness marks off dogs from sheep.

We can, by a little adroit questioning of children, see all these errors in their concepts of common classes of objects, such as tables and chairs and people, while with the still more abstract concepts, such as number,

distance, growth, time, and the self, the errors are all intensified. Their inferences and reasoning show the various errors described in logic, but also the correct forms, and if, with Rignano, we consider reasoning as a mental experiment, a carrying out in imagination of what later we try to carry out in fact, we should expect this. Here we can no more set a definite point of time at which abstract thought emerges than we can for any other process; but, on the other hand, it is greatly facilitated as soon as a child becomes conscious of his power to make new combinations, and has some control of speech, that is, by the third or fourth year. At this time there is an outbreak of questions, and there is likely to be one of so-called lies, which is really a period of experimenting in handling images. A child makes up all sorts of fictions, sometimes apparently just for the pleasure of it, and sometimes as an explanation. A little later, in the primary-grade period, he tends more to working out relations between objects he has to deal with, becomes more practical, and at adolescence finally broader conscious generalizations are made and logical reasoning may become almost a fetish for a time.

Early associations

According to Gale's observations, as well as according to what we should infer from other incidental observations, the associations of the first year are chiefly those of contiguity. Anything may be associated with anything else in place and time, so that it will call up the other in memory. The mother has the child at her mercy for forming good or bad, natural and permanent or artificial and temporary associations between his various experiences. There is no thought in the narrower sense of that term, but there is the formation of habitual sequences which may either persist through life or must later be broken with difficulty. If, for

instance, an association is formed between the baby's screaming and being taken out of bed and carried or held by the mother, in a very short time the baby learns the combination and reacts accordingly, though we have no reason to suppose that it reasons out the relation. This automatic relating and reacting goes on to some degree, perhaps we might say to a large degree, all our lives, but in proportion as it fails to give the agreeable result we are forced to greater consciousness and varied reactions.

This is the kernel of the whole problem of the development of thought within each of the main divisions just outlined. We have various studies on the development of thought and the differences between children and adults to which we must briefly refer. We saw in a previous chapter that when asked to give definitions of common terms the younger children defined by use or movement, while the older tended more to the use of larger terms. Ellison found a similar distinction among the four hundred and seventy-two children studied, and states that what might be called a fair definition did not appear before the tenth year. Among the youngest, eight-year-old children, the most common form of definition was to give an example. In more detail, the studies of Ziehen, Meumann, Winteler, Wreschner, and Rusk show that in giving association words to children to get their first associations the following classification is increasingly difficult: 1, If a whole is named to name a part of it; 2, the reverse of this; 3, a coördinate; 4, a free concrete term; 5, a superordinate term; 6, a subordinate term; 7, a free abstract term; 8, a causal relation.

Later associations

In general, this shows how childish thought advances from the concrete to the abstract, and these same studies

agree with Colvin and others in indicating that the clear visual imagery of childhood gradually passes over into the relatively indefinite verbal imagery of youth and maturity. Rusk agrees with Binet that in the latter period thought may go on without imagery. (Imagery in Binet's sense does not include the kinæsthetic factors.)

From visual to verbal

Still another point of view which seems to show similar differences is given in Lindley's study of puzzles. He says that the persons attempting to solve the puzzle choose one of three chief methods, which, of course, have many variants and combinations. The younger or the less intelligent use the method of trial and error, blindly fumbling at the puzzle, succeeding by chance, and learning only by the cumulative pleasurable effect of success. Next higher is what may be called the receptual method, in which there is some vague comprehension of the best point of attack, but nothing distinct; and third, the conceptual, in which the person thinks it out with considerable distinctness.

Trial and error to conception

He also found this difference reflected in the order of age interests for puzzles. Beginning with three or four years, and going up, the interest develops thus: riddles and very simple mechanical puzzles, charades, catches and quibbles, arithmetical, more complex mechanical, geometrical, language, and, finally, logical and personal dilemmas, the last two scarcely appearing before puberty.

These give us certain large and important differences between the different stages, but within each period what particular ideas develop most or first depends largely on the child's surroundings. Here we very much need observations to trace the natural development of our

fundamental concepts, and can give only a sketchy account.

Space

Ideas of space, with the related ideas of distance, direction, position, measuring, and so on, are derived primarily from active touch, and this we have seen develops even early in embryonic life. The unborn child adapts itself to the space relations under which it lives, gets sensations of contact from the uterine wall and also from one part of its body touching another, and so in all probability at least vaguely localizes the part of the body touched even before birth. With the possibilities of movement after birth and the combination of touch and visual sensations, we have seen how the perception of objects and of their position relative to each other and to the child develops. Distance means the movement needed to grasp or go to an object seen. Very early the child acquires a working knowledge of distance, direction, and so on, but the ideas of units of distance larger than his own experience, such as the mile, are likely to remain vague up to adult life, and of course exactness in calculation of the smaller units, like the foot and the yard, will be lacking unless special training be given.

Time

The sense of time is similarly confused, and, from what few observations we have, remains so for a considerable time. Chamberlain's child at two years and eight months used many time terms, such as this afternoon, this month, this summer, by and by, now, then, but did not seem to know their meaning. According to the Binet tests, children do not, on an average, know the difference between morning and afternoon until they are six, and not until nine can they give the days of the week in order, and name the day of the week and month, the month and the year,—that is, give the

complete date. The months of the year given in order belong to the ten-year-old tests.

Again, Miss Patterson collated 2,337 answers of grade-school children to the question "What does 1895 mean?" There were many blanks before eight years, and she concludes that the sense of historical time is utterly lacking before seven, and is slight up to twelve. We need many more observations here.

Concept of number

The baby's ideas of number are vague in the extreme; number in the abstract does not, of course, exist for him. He knows only many things or this one particular thing. At eighteen months Ribot says a child can distinguish concepts of one, two, and several. Dewey also notes that three children observed by him, varying in age from sixteen to twenty-eight months, paired off objects. Two could be counted but not three. At three years, Ribot says, a child can distinguish 1, 2, and 4, or 2×2. At five years, Binet says, he can count four. The baby's first vague impressions of quantity and mass are made more distinct through his own movements in touching and handling objects, and he is also aided by the regular alternations and rhythms in his experiences and in his bodily reactions. We know that in his first counting a little child is very likely to touch or tap as he counts, and that he likes to group the objects or words in counting by pronounced accents. He enjoys singing the multiplication tables, for instance. We must also distinguish, with the little child, between repeating number names, and real counting. A child will often apparently count to a high number, but when asked to show ten objects or twenty objects, he will be at a loss. Not infrequently a child takes the name of the number for the name of the object. If, for instance, the third object happen to be a willow rocker, he may think it a "three."

When a child has really learned to count, he delights in it, both counting the objects about him, and merely counting, without reference to particular objects. The boards in the sidewalk, the blades of grass, the stones in the road, are all enumerated, when he is not occupied in numbering up to hundreds of thousands, or to millions or billions.

At first, the child's idea of growth is simply that of increase in size. It does not include the idea of increasing complexity of the parts. To the childish mind, a stone may grow as readily as a child. **Concept of growth**

Mr. Sully has some speculations on childish ideas of growth which are interesting, though, perhaps, not so general in their application as he believes. A child, he says, cannot believe that things come from nothing or go to nothing; hence the natural idea of a cycle, babies growing to men, and men growing back to babies. Babies, a child is told, come from various places, heaven among others. He knows that they get larger by eating and drinking, and that after a time they stop growing and begin to shrink. Old people are frequently small, they are spoken of as childish, and when they die they are carried to heaven by the angels, hence they must grow still smaller after they die.

A child's ideas about the origin of life, the meaning of family relationships, and so on, inevitably are determined by the superficial view of what he sees and hears, unless special information is given. Many children think brothers and sisters are all the children in one house, fathers all the grown men, and so on.

The sense of self and the ideas about the self, though interdependent, may yet be distinguished. The sense of self depends upon all the stimuli coming in from all parts of the body, both internal and superficial, and

many of the resulting sensations, especially those from the vegetative organs, lungs, heart, and so on, are so vague and slight that they defy analysis. The *ideas* about the self come from the stronger sensations, and in health these are derived largely from the surface of the body, the special senses, and our movements. In the very brief space that can be devoted to this important subject, I follow Dr. Hall. In returns to questionnaires on the part of the body first attracting children, the following was the order of frequency: first, hands and fingers, then feet and toes, ear and nose. Eyes of course must come later, but the eyes of others are attractive to babies, and many children love to watch their own eyes in a mirror. Their own hair is also very attractive, and their teeth. Tongue and nails are experimented with by many children. Other parts of the body are much less attended to, though individual children may develop fondness for particular parts. Thus the child at first thinks of the surface of his body and scarcely at all of what is inside the skin.

Self

The first things inside the skin to be noticed are the hard bones, and many questions are asked about them between three and five years. Next comes the stomach. The heart beat and breathing attract attention to them, cuts to the blood, and so on. But these ideas remain crude in the extreme unless special pains are taken to give the proper information.

As early as the second year the child associates its clothes closely with itself, especially shoes, and this is probably connected with recognition of himself in the mirror and so the forming of a more complete visual image of himself.

The use of the personal pronouns is ordinarily considered one of the important signs of a growth in

self-consciousness, but the dates for their correct use and the order in which the various forms appear differ considerably. Sully reports a case in which "I" was used as early as the sixteenth month, but Preyer's boy did not use "mich" until the thirty-second. Other observations range between these. Gheorgov is probably correct in saying that the order in which the forms are learned depends especially upon those most frequently heard.

When the distinction is made between the body and the self, children conceive the self in the most various forms, according to some chance associations—as a flower, animal, room—but most often, like primitive peoples, as a shadow-like form resembling the body. It seems no more possible to eliminate imagery here than in religious thought, and our endeavor ought to be to find an image which shall be flexible enough to include all the wider ranges of personality. This distinction between body and self as the first differentiation of the material and immaterial, is very significant. Probably it must follow the rise of imagination, and it may be causally related to the feeling of power over his mind that the child gets when he finds he can invent stories that never really happened. The feeling of strangeness is seen in such questions as: What am I? What do I do when I think? You can strike my hands but not the real me. What is it that is sorry in me? Again, this rise of self-consciousness makes children watch themselves in the mirror when they cry, talk to themselves, scold and praise themselves, and so on.

Taking a somewhat different standpoint, the difference between the self and the not-self is impressed upon the baby from the beginning in his contacts with and manipulations of things, especially those that offer some resistance. The way in which his sense of other personalities

is built up we shall touch upon in considering imitation, and the chapters on the child's characteristic ways of acting may be considered as in truth discussions of the developing sense of self. The whole process of building up an adequate concept of self and of others is the most complex in our experience, and involves the wide range of all intellectual, emotional, moral, æsthetic, and religious experiences, as well as of our efficiency in the various fields of motor skill, in our profession, and so on. In its wider ranges it is the history of civilization.

Forming correct concepts

From the sketchy accounts so far given, it is painfully evident how defective is our knowledge of the growth of children's ideas in specific fields. It is even more so with regard to the subjects of the curriculum. Children's ideas about the earth and its inhabitants, the town or city where they live and their government, the animals and flowers about them, the materials and tools which they must use, the food they eat, and so on, should be, at least to some extent, canvassed by the teacher who is just beginning a given subject. This may often be done by devoting the first few periods to an informal talk, drawing out the children and noting the various sources of error mentioned, with a view to correcting and complementing them later. If the child's ideas of a class depend upon his acquaintance with objects of the class, it is evident that the first step toward getting a correct idea is to give many objects with which to get acquainted. A child who has seen only one dog, cannot know as much about dogs, other things being equal, as the child who has played with several. A child who has seen but one river has a more imperfect idea of rivers than a child who has seen many. Of course, by far the best way is to show the children the actual object, but if

this is impossible, pictures do a great deal, especially pictures that differ in minor details but agree in essentials.

It is hardly enough, however, simply to put the various objects or pictures or ideas before the child. He should be led to judge whether the differences are so great that the objects cannot be put into one class. The degree to which this comparison is carried out must be decided by the teacher. Kindergarten children notice only the more striking likenesses and differences, but in the ninth year a great awakening occurs.

Such comparison is quite as important as having many objects because it means, once more, the forming of associations which bind the child's world of thought into a whole, and it lays the foundation for the systematic reasoning which occurs in later life.

We have already answered indirectly the question of whether general ideas can exist in the child's mind before language. It seems unquestionable, from the way that a child acts toward objects that are alike, that he does have some class ideas even before he has learned to speak.

Conception and language

On the other hand, there can be no doubt that language facilitates the formation of concepts because it provides a convenient form in which to keep the idea. Then, too, when the baby learns to speak, the great widening in his ability to get what he wants is a powerful stimulus to mental activity, and to the naming of things.

The first questions are usually about what things are, and this often means only what their names are. The fact that this thing is a "dictionary" is itself satisfying enough to rest in for some time. Some children seem to have a mania for learning the names of objects; they seek for the Christian name of every fish and insect and leaf, and when the wearied mother tells them that there

are no such names for them, the child in pity christens them himself. Some anthropologists see in this a survival of the early worship and fear of the word as a living thing. The Scriptures tell us that the Israelites dared not pronounce the true name of Jehovah; in the Middle Ages it was believed that there were words whose potency was sufficient to summon all the powers of evil to the aid of the bold man who spoke them; and so, in the little child's satisfaction with a name, there is perhaps implicit belief that it has a certain force of its own.

For a long time a child is at the mercy of verbal sounds, mistaking words for others that sound like them but are spelled differently, or getting the wrong word. We all have some choice examples of this. Here are two: One child sang lustily,

> "Dare to be a spaniel (Daniel),
> Dare to stand alone,
> Dare to have a purple spine (purpose fine),
> And dare to make it known!"

Another one, when asked by her father what she had learned in Sunday school that morning, told him earnestly that the minister said that "he must put his trousers in heaven, where the moths could not get at them!"

However, when a child begins to question what things are *like*, the question of what things *are* begins to mean what they are like.

Imagination and reason

The period before nine, when all the quaint, childish fancies that so delight us control the child, is especially the age of imagination. The odd comparisons between familiar things, the imagining of a situation that may have led up to present conditions, are fancies, but they are also attempts to make the world unified and reasonable.

We have seen that the child's first class idea is the same as his idea of the individual, and is separated from it only through varying experience. So his first reason is an image or a craving, as is also the reason of many adults, and takes the form of logic only with a later development. When we ask a child *why* he did this, it is hard for him to say, because his reason is probably only a desire, a picture of himself enjoying a certain thing, and it is hard to put this into words. "Because," or "Because I wanted it," is as far as he can go.

Conception and reasoning

In reasoning, a more developed form of thought than a conception is reached, for in it the relations which were taken for granted before are now stated. The concept of table includes the ideas of a flat top and of usefulness to put things on; but the reasoning about tables, expounds that this is a table *because* all tables have the same qualities that this has. We recognize clearly now relations that before have either been unseen or only obscurely seen.

Reasoning takes three common forms—the tracing of a particular cause to a particular effect; the discovery of a law or truth or system from observation of particular facts; and the classifying under an already known law the facts afterward observed. We will consider the child's reasoning under these heads.

Reasoning from cause to effect

Throughout all the child's thinking, as in his imagining, he works from a personal world to an impersonal. His first ideas of cause and effect are doubtless obtained from his own movements and their results, and the sense of power appears to have its rise with the first volitions or persistent imitations in the period between four and six months. During this period the child seems to be experimenting to see what he can do. He repeats and

varies a movement *ad infinitum*, discovering the possibilities and limitations of his movements, and at every step connecting a given movement with a certain objective result. Thus he learns that he can always get certain things by doing certain others, and has the feeling of himself as a power or cause. In all his experiences, he and others like him are, more than anything else, the causes, or movers of things. He sees very little of impersonal natural causes. This strengthens what seems to be his instinctive tendency to refer all results to a personal cause. As Sully puts it: "He starts with the amiable presupposition that all things have been hand-produced, after the manner of household possessions. The world is a sort of big house where everything has been made by somebody, or at least fetched from somewhere." "To ask *who* made the animals, the babies, the wind, the clouds, is for him merely to apply the more familiar type of causation as the normal rule." One three-year-old girl thought that when the water spurted from the faucet it was choking, because it coughed. One child of four years thought that *running* water was alive; and another, that windmills were alive, because they moved. Most small mothers think that their dolls or pets must like the same things that they do themselves.

Observations have been made upon kindergarten children to ascertain when they first asked "why." It was found that all children had asked "why" before the third year, and 75 per cent of the boys asked it before the second year. The first real interest in the idea of cause, however, is not usually shown by the *first* "why"; but appears between six months and a year later in 70 per cent of the children.

The objects which call out this first question vary considerably in boys and girls, seeming to point to certain

differences in the natural interests of the two. Thus 75 per cent of the boys' questions relate to natural causes, while only 30 per cent of the girls' do. Such questions as, "Why does it grow dark?" "How does God make it thunder?" fall here. Fifty per cent of the boys ask questions about movements, such as, "Why do wheels go?" "Why do horses run?" while only 25 per cent of the girls are first interested in movement. Twenty-five per cent of the boys are curious about the adaptation of structure to function: "Why do birds have wings?" "Why does Towser have four legs and I only two?" The girls have little interest in this.

On the other hand, the girls ask more first questions about God and Christ, and about domestic affairs. Both boys and girls always show great persistency in following up a question with others until a satisfactory answer is obtained.

Along with this idea of personal cause goes the other idea, that everything has a purpose behind it, and so we find children ready to believe that the sun rises for them to get up by, that the flowers grow for them to pick, that the rain is trying to plague them, and so on. **Idea of purpose**

We can realize how deep in human nature lies this tendency to make man the center of all things when we find the earliest men, the savage races of to-day, and even the civilized man himself doing the same thing. I fancy that there are few of us who have not at some time been thoroughly angry with some object or material that we could not control as we wished. In early times inanimate things and animals had legal punishment meted out to them as to persons.

In these first experiences, what reasoning there is, is usually only an association of one thing with another.

Thus, the child who learns that the father gets home and then supper follows, may reverse the procedure and suppose that getting supper ready is the cause of the father's arrival.

Reasoning by association

The assertions that the object of Thanksgiving is so that we can have turkey, and of Christmas so that we can have presents, combine both forms. Little by little, the child is forced to discard a personal agency for a simple sequence of events, and so he seems to become less imaginative.

Of cause in the sense of reason, he seems to have little idea as yet. Sequence and analogy of sequence govern his thought. Mr. Brown gives numerous instances of this. Thus one boy would be a minister so he could have the money from the collection boxes. One little girl said she was a woman now because she had a butter plate given her instead of having her bread spread.

Preyer's boy in the fifth month first connected movements with the following noises: the tearing of paper, the jingling of keys, the opening and shutting of a drawer with the accompanying sound. He would strike a spoon against a plate, listen, and then repeat it as if trying to see where the sound came from. His delight in producing such results was at its maximum during the tenth month, and Preyer believes this indicates the knowledge that he was an agent or cause. But even then he had not learned that objects, when dropped, fall to the ground, and gaped with astonishment to see them go.

By degrees, however, definite sequences are established, and then occurs the reasoning which is so ludicrous to us and so sensible to the child. One child thought that a person with gray eyes must be old. Another of three years and three months thought that a card lying on the floor was the

Establishing of sequences

cause of the sewing machine not going, because when his mother got up to pull the machine out from the wall, she first picked up the card from the floor.

Analogy of sequences is seen in such cases as these: One child of two and a half thought that her baby sister only needed larger shoes in order to walk; another, that her eyes were bright because the sun shone into them as into a room; another, of five, that men are filled with sawdust, like dolls; a boy of five, that standing in the rain until he got soaked would make him grow fast, as it does seeds, so that he could wear "pants"! One girl of six, when told that gum was grease and was not good, reasoned thus: "Lard is in doughnuts, lard is grease. It's good!" and continued chewing. A boy of five reasoned that thunder was made in heaven in the same way that sounds are made in a sawmill. A girl of seven was afraid to eat apple seeds, lest they grow up to trees. Another wondered why, if she were dust, she did not turn to mud when she drank water. One girl thought her brother pale because he washed so much. Then, too, there is the little boy who thriftily planted his dime to have it grow, and another who planted bird seed to get more birds and sardine cans to get more sardines. Again, one boy thought his mother could round some pieces of cloth better if she had a poker to use as the motorman uses his to get around a corner. The small boy who had lost a tooth and thought the new tooth of his baby sister must be his, is not alone in his reasoning.

Such examples show us how vague the child's ideas are. He has to learn that balls will roll away if his hands let go of them; that he can use his hands to move things, and so on. When we consider that a child begins life with no knowledge, we must admit that to learn so

much in the short space of a year he reasons much instead of little.

This purely temporal relation of one event to another, if it be a constant one, gives to the child his first idea of law and order. In his contact with nature, he experiences certain fixed sequences, such as the seasons and day and night. In his contact with people, and in the ordering of his daily life he should find the same thing in all cases where his mature mind will later justify the order by reasons. Just in proportion as we, his elders, arrange our lives and his according to an order controlled by laws, shall we help him to untangle the essential from the unessential.

Idea of law and order

Plato, in discussing the proper education of youth, makes the point that we cannot get citizens who are obedient to law in later life unless we have trained them to a respect for law in childhood. Now, what Plato says of civil law is equally applicable to law in its widest sense. The child who is given meals at irregular hours, who is never trained to habits of bathing and cleaning the teeth, of sleeping, and so on, will never have a respect for the laws of his body. If he is trained to the fallacy that he can eat and drink just as he pleases, without bad results, that he can sleep or not and feel just the same, that he can bathe or not, and still be clean, he cannot have the belief in cause and effect that the child who has been taught to observe regularity in all such things has. Order or regularity is the same as law to the little child; and to primitive peoples also, custom, or the usual way, is the law. The reason upon which this law rests becomes apparent only later. Hence it is our part to see that children acquire habits or customs of orderly acting and thinking, customs which need not be disturbed when reason passes them in review. So shall respect and

obedience to law be a work of love and not of duty.

To many it will probably seem rather pretentious to class the modest efforts of children to make their world into a connected whole under inductive reasoning, which is the method of scientists. But precisely because the two are not usually associated in our thought, we wish to unite them here. The child mind is trying, though spasmodically, to reach to a system of thought. He does not like to live in a chaotic world, and although his efforts to produce order are greatly limited by his inexperience and by his undeveloped power of attention, the desire for unity which impels him is the same as that which impels the scientist.

Inductive reasoning or attempts at system making

In discussing the child's thoughts about nature, Sully says that we can see some crude attempts to form a system and to get back to the first cause which will explain all else. In what little we know of the child's naïve thoughts on this subject we are strongly reminded of the speculations of the early philosophers. The child, too, wonders who made God; who were the first people and who took care of them when they were babies; where the first hen came from, and so on. The child, like the race, seems first to ask "why" and only later to become interested in "how" and satisfied with it.

When he comes to frame his cosmology, things are taken for what they seem. The earth is flat and the sky round; the stars and the moon shine through holes in the sky and are lamps for God or the angels. Natural phenomena, like thunder and lightning, storms, wind, are caused by God for some definite purpose of His own.

Most children have some such imperfect system, which they fill out from time to time in detail. Thus, one boy of six, after watching the smoke rising from a

locomotive, said he knew now that smoke made the sky. This was not so bad for a city dweller.

Consistency in reasoning

The consistency of these childish reasonings is a subject on which we have as yet few exact data. Earl Barnes assures us that it is difficult for a child to hold a whole subject in his mind because his thinking is fragmentary. In drawing the story of the "Three Bears," for instance, a child will often forget the story in his delight in drawing the bears, and will fill the paper with bears and nothing else. This is doubtless true to a certain extent, though Rossma believes that when actually drawing the child fills the apparent gaps by speech and acting. We have already seen that the little child's interest is immediate, and that he does not clearly distinguish means from ends.

Still, we must not suppose that a child sees no connection between cause and effect, and does no connected thinking. Observations made by Miss Lillian Clow seem, on the contrary, to show that when children have once made an assumption about an object, they hold to that fairly well in the rest of their thinking about that object.

Miss Clow[1] collected data from three hundred and sixty children, forty of each grade from kindergarten through eighth grade, in order to see how their reasoning changed as they grew older. She selected a sea porcupine as an object with which the children were unfamiliar, so that their reasoning would not be directly influenced by their knowledge, but which was yet striking enough to arouse curiosity and stimulate thought. This was shown to the children and they were asked these questions among others:

1. What does it look like?

[1] Unpublished data from Chicago school children. The object was a beautiful specimen of a sea porcupine. The tables are given in per cents.

2. What do you think it is? Why?

3. Where did it come from? What makes you think so?

4. If it moved from one place to another, how did it go?

The following tables show the answers.

QUESTION 1	Kg.	1	2	3	4	5	6	7	8	TOTAL
Fish	15	37½	40	47½	52½	85	50	52½	27½	45⅝
Porcupine	0	2½	17	22	15	7	42	15	42	18
"Porcupine fish"	0	0	0	7	0	2	0	10	0	2
Miscellaneous	77	55	37	17	27	5	7	17	30	31

QUESTION 2	Kg.	1	2	3	4	5	6	7	8	TOTAL
Fish	17	52	57	57	62	87	65	85	80	64
Porcupine	0	5	25	20	25	7	25	2	12	10⅝
"Porcupine fish"	6	0	0	5	0	2	2	10	0	2
Miscellaneous	62	37	12	12	10	2	7	2	5	17

QUESTION 3	Kg.	1	2	3	4	5	6	7	8	TOTAL
Sea or ocean	2	22	40	40	45	75	37	77	65	45 } 63⅜ = Water
Lake, river	15	30	42	25	20	12	10	2	10	18 }
Geog. place	2	2	7	5	2	12	42	17	22	12⅞
Miscellaneous	67	40	10	25	27	0	10	2	2	20⅝

QUESTION 4	Kg.	1	2	3	4	5	6	7	8	TOTAL
Swam	17	47	70	57	67	87	65	87	77	64
Crawled or walked	25	15	12	30	10	2	20	5	5	11
Rolled	17	12	10	12	10	10	7	2	12	10

One of the interesting things in these tables is to see how the percentage of miscellaneous answers decreases from the kindergarten up. Whereas 69 per cent of the kindergarten children give such different answers that they cannot be classified, only 5 per cent of the fifth grade and a somewhat larger number of the eighth grade do. This seems to show the effect of the interchange of

ideas in training all children to similar habits of thought so that they reason in much the same way even on new subjects.

Deductive reasoning, or classifying by a standard

In discussing the consistency of the answers, we see how well the children hold to a standard that they have chosen. Thus if a child says in the first answer that the strange animal looks like a fish and is a fish because it has little fins, and that it will live in water, and swim, he is thoroughly consistent throughout with his first assumption that it was like a fish.

The answers to the first three questions were clearly consistent in 51½ per cent of the individual papers, and clearly inconsistent in 16½ per cent. In the remaining cases the child's thought seemed confused. These percentages were distributed as follows:

	Kg.	1	2	3	4	5	6	7	8	Total
Consistent.....	28⅓	26	61	53	44	72	74	82	78	51
Inconsistent.....	10	16	20	23	18	19	19	13	17	16

We should hardly seem justified from these figures in concluding that even the little child's thought is *predominantly* fragmentary. It may be true that the systematic questioning made the children relate their answers more closely than they would have done if left to themselves, so that the percentage of consistency may be a little higher than it should be; but even so, it would seem that a child's thought is not so much inconsistent as it is incomplete.

The improvement in consistency from 28⅓ per cent in the kindergarten to 78 per cent in eighth grade is very marked, and is closely paralleled by Mr. Hancock's observations on reasoning about numbers. They show

an improvement from 40 per cent of correct reasonings at the age of seven years to 86 per cent at fifteen.

Adapting means to ends

A simple form of deductive reasoning is seen in the adaptation of means to ends, as when the year-old child pulls the tablecloth over to bring a dish within reach, or climbs into a chair for the same purpose. Or when the three-year-old feigns a cough in order to get some cough drops. A more elaborated form is seen in the boy of four who wanted to get a bone from a dog. When he found that he could not catch the dog by chasing him, he got a stick and brought it to the dog to smell. In smelling, the dog dropped the bone, and after one unsuccessful trial the boy got it. Akin to this is the thriftiness of the boy who, when given some money, bought some court-plaster "because I might need it some time." We have also the numberless plans to escape punishment. One little child scrawled the newly papered wall, and when confronted with a whipping by an indignant mother, appealed to her affections thus: "I just writed a letter to my dear papa. Ain't my papa lobely?"

Arithmetical reasoning

In its more logical form deductive reasoning is seen with especial clearness in the solution of arithmetical problems, and as the teaching of arithmetic is also an important part of the curriculum, the observations and experiments along this line will be briefly referred to.

We should distinguish rather sharply mere ability to count and to perform the fundamental operations from ability to solve problems. In the first two the drill element is much larger than in the last. We have noted that in the Binet tests, one of the five-year-old tests is to count four pennies, pointing to them; one of the seven-year-old tests is similarly to count thirteen pennies, and two

thirds of the six-year-old children are said to fail on this. Bonser, however, testing forty-five children just entering school, found the median number to which they could count was 100, and the range of variation 3 to 1,000. He does not indicate whether there was any test of knowledge of what this meant or whether it was mere rote repeating.

The various tests of the ability to reason all show, as we should expect, improvement with age and training, whether the problems are concerned with arithmetic, or with cases of false reasoning, assuming that the subject matter is familiar. But it also appears that not infrequently school children are expected to reason without the necessary basis of familiarity with the data to be handled. One of the most important investigations here is that of Bonser. He gave four kinds of tests: arithmetical problems such as those ordinarily found in textbooks; controlled associations (filling in a blank in a sentence, and also crossing out the unsuitable one of two suggested words in a sentence); writing the opposites to a list of sixty words; selective judgment — choosing the correct reason among ten given for the truth of a statement, choosing the correct definition out of five given, and literary interpretation, which consisted in giving the content of certain stanzas in the pupil's own words. Bonser tested seven hundred and fifty-seven children from fourth, fifth, and sixth grades, nearly equal numbers of boys and girls. The hardest test was that of literary interpretation, then selective judgment, mathematical judgment, and controlled association. The percentage of improvement from grade to grade is very suggestive. For boys it is: 32.44 per cent from A to 5B; 3.21 to 5A; 16.43 to 6B; 9.62 to 6A. For girls, 12.50; 12.82; 14.24; 8.48. That is, the improvement of the girls is much steadier than that of the boys, and that of the boys is much the greatest

between the first two grades. Correlation between individual tests ranges from .45 to .53; but correlation between each individual test and all the tests taken together, ranges from .85 with the opposites test to only .37 with the literary interpretation test. That is, the pupil who stands well in the opposites test will average well in the others, but the correlations between the individual tests indicate that the abilities tested are too different for us to infer from test to test. Stone's tests in arithmetic alone point in the same direction. He found (testing six thousand children) that the correlations between the fundamental operations are very high—.92 to .95; that is, children good in one are very likely to be good in all. But the highest correlation of a fundamental with reasoning is that of subtraction, and that is only .50, while that of addition is only .32. A child may be very good in addition, subtraction, multiplication, and division without being good in reasoning.

Though it is aside from our main problem here, we ought to note that both Rice's and Stone's studies, in which large numbers of children from various cities were tested, show no constant relation between the amount of time spent in arithmetic and the good results obtained.

Fox and Thorndike, testing seventy-seven high-school pupils along this same line, found similar independence between the fundamental operations, problems, and working with fractions.

These tests as already noted touch only upon the deductive aspect of reasoning, and only upon a small part of that. The application of a code of morality, a standard of truth, of beauty, to particular cases would give still other phases of this subject, and these will be touched upon in connection with moral, æsthetic, and religious ideas. Construction is still another phase.

In considering what use parents and teachers can make of the rather fragmentary data given in this chapter, at least two fundamental pedagogical situations appear. The first is the large one of putting the child under conditions which will demand from him thoughtful adaptation not beyond his powers of accomplishment. Normally, children are both inquisitive and adaptive; they love change and reaction to change, and if they are supplied with plenty of sense material, as already indicated, they will go far even alone. We have also seen how spontaneously they create and imagine for pure love of doing so, and much more when there is some need to motivate the action. The mother and teacher can supply situations demanding planned action, and should do so.

Need of genuine problems

Another of the best ways to encourage this as well as systematic thought is by wise answering of questions. There is a certain kind of questioning into which some children fall automatically. They do not ask because they do not hear or because they want to know, but simply for the sake of saying something. Usually, if no answer is given them they wander on to something else, and from that to something else. Frequently they themselves know the answer to the question they ask. Such a bad habit can usually be broken by asking in turn of the child the question he has asked, thus making him realize how foolish or how thoughtless he has been. However, when a child waits for an answer, and persists in the question, he should be answered in as true and scientific a way as he can understand, and should be encouraged to ask more questions, instead of being repressed.

Questions

Educational bearings: children's questions

Wonder, or curiosity in the good sense, is the root of

all love of knowledge, and it is one of the greatest discredits to our present school system that it is more likely to crush this tendency than to nurture it into the scientific spirit. The child who enters school curious at every point, overflowing with questions, and brimful of wonder and reverence at the mysterious things about him, becomes in a few years passive and quiet, a receptacle for any information that is poured into him, and blind to any value or beauty that it has. The teacher asks all the questions and he has to answer them. Seldom are the tables turned. Such a condition is very different from the ideal school, in which there is a constant give and take in question and answer between teacher and pupils, and where both teacher and pupils are learners. Both have doubts to settle, and can settle them best by a free discussion.

Again, we often do not know how to answer a child's question in a way that he can understand. When he asks why it thunders, or why the leaves fall off, it is puzzling to know what to say. Often, if we can cite some similar case, it satisfies him. If he has ever seen an electric spark, he will probably be contented to know that the lightning and thunder are just a big spark and the noise that it makes. Such an answer has the further advantage of connecting in the child's mind similar phenomena, and of forming the habit of looking for such similarities. Certainly it is useless to give the child superstitions about such well understood scientific facts as these. There is, however, the question of whether we should answer a child imaginatively or literally. Mr. Sully is authority for the statement that when a child is in the imaginative age, between four and eight, we can best answer such questions as why the leaves fall by saying they are tired of hanging on the trees. We can

say Jack Frost draws the pictures on the window pane, and in various ways assume, as the child himself does at this time, that all causes are persons. In this connection we have also the much mooted question of whether we shall teach children to believe in Santa Claus and fairies.

There is, I believe, a point to be made here which sets a standard for the sort of answer to be given. It is certainly true that the child from four to eight years old lives in a world that is personal through and through, and that he delights in Santa Claus and fairies. Now, the point is this: Can we not answer his questions imaginatively, and still in such a way as to present the scientific truth, though not in a literal form? There is a certain truth in the statement that the leaves are tired of hanging on to the trees, and that they drop off because they are old and weak. The child told this goes on easily, when he can, to the knowledge of the changes in the leaf that dry it and let it drop off. The essential thing is to state the truth as nearly as we can, though in the imaginative form, and not to give a child the imaginative answer when he is old enough for the scientific.

Cultivating reasoning

Finally, to cultivate a child's reasoning powers, there is no better way than to start with his own question, and answer enough of it to give him the necessary information and the curiosity to think out the rest of the answer. Constantly suggest the question of how this fact is related to that: If leaves drop off because they are tired, why do not the oak and evergreen leaves get tired? Or do they get tired too? Why do the leaves come out in the spring? If lightning is an electric spark, why don't we use it in our houses, as we do electricity? Lead the child, through imitation and suggestion, to form the habit of questioning and of thinking out the answers to the questions. The person

who can question wisely renders the greatest intellectual service possible to another in the way of stimulation and suggestion. It has been well shown in the *Aussage* tests that all questions have something of a suggestive power, if not in their own form then in the manner, inflections, and so on, of the questioner. A question is fundamentally a command or an appeal, and involves factors of will and emotion in addition to that of knowledge, when the situation is normal. Unfortunately, many teachers do not consider questions as aids to purposive thinking for their pupils, but use them only for the purpose of testing knowledge already acquired, and even then they oftentimes suggest the answer by the way they ask the question. As a result, the pupils soon learn to pay less attention to the content of the question than to the manner of asking, and become adepts at giving correct answers without much real knowledge of the subject under discussion. If we teachers could give purposive, non-suggestive questions adapted to the pupils a long step would be taken toward obtaining ideal schools.

REFERENCES

Arnett, L. D. Counting and Adding. *Am. Jour. Psy.*, Vol. XVI, 1905, 327-366.

Bair, J. H. The Development of Thinking Power in School Children. *U. of Col. Invest. Dept. of Psy. and Ed.*, 1906, Vol. III, 45-51.

Baldwin, J. Mark. *Mental Development, Methods and Processes.* Section on Concept. Macmillan, 1897.

Thought and Language. *Psy. Rev.*, May 1907, 191-204.

Thought and Things—Genetic Logic. 3 vols. Macmillan, 1906-11.

Bentley, I. M. Psychology of Mental Arrangement. *Am. Jour. Psy.*, Vol. XIII, 1902, 269-293.

Binet, Alfred. *The Psychology of Reasoning.* Open Court Pub. Co., Chicago, 1899, 191 pp.

Bonser, F. G. The Reasoning Ability of Children of the Fourth, Fifth, and Sixth School Grades. *Teach. Coll. Cont. to Ed.* N. Y., 1910, No. 37, 133 pp.

Brown, H. W. Some Records of the Thought and Reasonings of Children. *Ped. Sem.*, 1898, Vol. II, 358-396.

Brown, J. C. An Investigation of the Value of Drillwork in the Fundamental Operations of Arithmetic. *Jour. Ed. Psy.*, 1911, Vol. II, 81-88.

Brown, W. An Objective Study of Mathematical Intelligence. *Biometrika*, 1910, Vol. VII, 352-367.

Browne, C. E. Simple Arithmetical Processes. *Am. Jour. Psy.*, Jan. 1906, 1-37.

Burnham, W. H. Arithmetic and School Hygiene. *Ped. Sem.*, 1911, Vol. XVIII, 54-73.

Burt, Cyril. Tests of Higher Mental Processes. *Jour. Exp. Ped.*, 1911, 93-112.

Chamberlain, A. F., and T. C. Meanings and Definitions in 47th and 48th mos., *Ped. Sem.*, 1909, 64-103.

Clapp, H. L. Educative Value of Children's Question. *Pop. Sc. Mo.*, 1896, Vol. XLIX, 799-809.

Colvin, S. S. Ideational Types in School Children. *Ped. Sem.*, 1909, 314-324.

Cooley, C. H. Early Use of Self Words. *Psy. Rev.*, 1908, 339-357.

Courtis, S. A. Measurement of Growth and Efficiency in Arithmetic. *Ele. Sch. Teach.*, 1909-1910, Vol. X, 58-74, 177-199; 1910-1911, Vol. XI, 171-185, 360-370, 528-539.

Devices for Fixing the Fundamental Operations in Arithmetic. *Teacher's Monographs.* N. Y., Oct. 1911, Vol. XIII, 12-15.

Davis, Anna I. Interest in Causal Idea. *C. S. M.*, Vol. II, 226-232.

Dewey, John. Psychology of Number. *Ped. Sem.*, Vol. V, 426-434.

How We Think. Heath, 1910, 224 pp.

Ellison, L. Children's Capacity for Abstract Thought as Shown by Their Use of Language in the Definition of Abstract Terms. *Am. Jour. Psy.*, 1908, Vol. XIX, 253-260.

Fisher, S. Carolyn. Arithmetic and Reasoning in Children. *Ped. Sem.*, Dec. 1912, 48-78. Bibliog.

Fox, W. A., and Thorndike, E. L. Relations between the Different Abilities Involved in the Study of Arithmetic; Sex Differences in Arithmetical Ability. *Columbia Univ. Contr. to Phil., Psy., and Ed.* N. Y., 1911, Vol. XI, No. 2, 32-40.

Griggs, G. O. Pedagogy of Mathematics. *Ped. Sem.*, Sept. 1912, 350-375.

Hall, G. Stanley. Contents of Children's Minds on Entering School. *Ped. Sem.*, 1891, 139-173.

Hancock, J. A. Children's Ability to Reason. *Ed. Rev.*, 1896, 261-268.

Reasoning in Teaching. *Ped. Sem.*, June 1911, 184-196.

James, W. Thought before Language: A Deaf Mute's Recollections. *Phil. Rev.*, 1892, 613-624.

Keyser, C. J. Exercises in Thinking about Number and Space. *Ed. Rev.*, 1903, Vol. XXVI, 246-253, 394-401, 486-493; 1904, Vol. XXVII, 36, 160, 270.

Mathematics. *Columbia Univ. Contr. to Phil., Psy., and Ed.*, 1907, 44 pp.

King, C. H. Reasoning Power of Children. *Paid.*, 1903, 157-162.

Kirkpatrick, E. A. Financial Training of Children. *Ch. Wel. Mag.*, Nov. 1912, 73-8.

Lindley, E. H. Study of Puzzles. *Am. Jour. Psy.*, July 1897, 431-493.

MacDougall, Robert. Rhythm, Time and Number. *Am. Jour. Psy.*, Jan. 1902, Vol. XIII, 88-97.

McLellan, J. A., and Dewey, J. *The Psychology of Number, and Its Applications to Methods of Teaching Arithmetic.* Appleton, N. Y., 1895, 309 pp.

Messenger, J. Franklin. The Perception of Number. *Psy. Rev.*, Monog. Sup., 1903, Vol. V, 44 pp.

Metzler, W. H. Experimental Pedagogy of Geometry. *Jour. Ed. Psy.*, 1912, Vol. III, 545-560.

Miller, I. E. *Psychology of Thinking.* Macmillan, 1909, 303 pp.

Monroe, W. S. Money Sense of Children. *Ped. Sem.*, Mar. 1899, 52-58.

O'Shea, M. V. Psychology of Number. *Psy. Rev.*, 1901, 371-383.

Perez, B. Développement des idées abstraites chez l'enfant. *Phil. Rev.*, Vol. XL, 449-467.

First Three Years of Childhood. 163-223, Elaboration of ideas. Bardeen, Syracuse. $1.50.

Phillips, D. E. Number and its Application Psychologically Considered. *Ped. Sem.*, Oct. 1897, Vol. V, 221-281.

Genesis of Number Forms. *Am. Jour. Psy.*, July 1897, Vol. VIII, No. 4, 506-527.

Pillsbury, W. B. *Psychology of Reasoning.* Appleton, 1910, 298 pp.

Queyrat, F. *La logique chez l'enfant.* Alcan, Paris, 1902, 157 pp.

Ribot, Theodule A. *The Evolution of General Ideas.* Open Court Pub. Co., Chicago, 1889, 231 pp.

General Ideas of Children and Deaf Mutes. Open Court Pub. Co., 1899, 164-175.

Rice, J. M. Series in *Forum* for 1903 on Arithmetic.

Robertson, Stewart A. Money Sense in Children. *Paid.*, 1901, Vol. III, 12-17.

Rusk, Robert R. Mental Association in Children. *Brit. Jour. Psy.*, 1910, Vol. III, 349-385.

Ruyssen, Th. *L'évolution psychologique du jugement.* Alcan, Paris, 1904, 282 pp. Bibliog.

Schaeffer, Nathan C. *Thinking and Learning to Think.* Lippincott, 1903, 351 pp.

Social Education. Ginn, 1908, 300 pp.

Scott, Colin G. Secondhand Science and Children's Reasoning. *Ed. Rev.*, 1906, 167-179.

Small, M. H. Instinct for Certainty. *Ped. Sem.*, 1898, 313-380.

Stevens, R. *The Question as a Measure of Efficiency in Instruction.* Teachers' College Pub. N. Y., 1912, 95 pp.

Stone, C. F. Arithmetical Abilities. *Columbia U. Contr.*, 1908, 99 pp.

Sully, James. *Studies of Childhood.* Appleton, N. Y., 64-91. $2.50.

Swift, E. J. *Mind in the Making.* Scribner's, 1908, 329 pp.

Terman, L. M. A Study of the Intellectual Processes of Seven "Bright" and Seven "Stupid" Boys. *Ped. Sem.*, 1906, Vol. XIII, 307-373.

Walker, F. A. Arithmetic in Primary and Grammar Schools. *Boston School Documents*, 1887, Vol. II, 20 pp.

Wellmann, Francis. *Art of Cross Examination.* Macmillan, 1905, 404 pp.

Winch, W. H. Accuracy in School Children. *Jour. Ed. Psy.*, 1910, Vol. I, 557-589.

Further Work on Numerical Accuracy in School Children. *Jour. Ed. Psy.*, 1911, Vol. II, 262-271.

Memory. *Brit. Jour. Psy.*, 1911, 95-125; 1910, 386-405.

Wright, W. R. Some Effects of Incentives on Work and Fatigue. *Psy. Rev.*, 1906, Vol. XIII, 23-34.

Yamada, Sochichi. Study of Questioning. *Ped. Sem.*, June 1913, 129-186. Bibliog.

Young, Sarah. Children's Saving and Spending. *Paid.*, 1904, Vol. VI, 6-17.

CHAPTER XI

Religious Sentiment and Theological Ideas

Question the children on the following points:

1. God. Where is He? What does He do? Why can we not see Him?

2. Death. Why do people die? Where do they go?

3. Heaven. Where is it? Who go there? What do they do there? What will children have there?

Observations borrowed from Earl Barnes

4. Hell. What must a person do to go there? What is it like?

5. Angels. What do they do?

6. Ghosts. Why are people afraid of them?

7. Witches. What can they do?

8. Prayer. Why do people pray? Why do they not get what they pray for?

9. Why do people celebrate Christmas? Why do they go to church?

Introduction

In entering upon a subject on which there are so many differing opinions, a word as to the standpoint taken is necessary. The attempt is made here, as elsewhere, to state in an unbiased way all the facts so far reached by actual observation and questioning of children and adults, and to draw only what conclusions are warranted by those facts. The fundamental principle that the teaching of childhood largely determines the adult's belief is the idea which is here worked out in detail. The close connection between physical and mental states also receives further emphasis

from the study of religious phenomena, and we do not believe that religion is belittled by the acknowledgment of this connection, any more than natural science is. Rather, the necessity of religion is emphasized.

The attempt to sum up religious feelings, conversions, and so on, in tables may also seem to some to be, from the very nature of the case, futile. It must be remembered, however, that these data are obtained from the individuals undergoing the experiences thus tabulated, —just as were the data for imagination and memory,—and are reliable to the same degree. Doubtless more data are needed to corroborate those given, but equally are more needed to discredit them. They are simply contributions to aid in solving the difficult problem of religious instruction.

Morality, religion, and theology

At the outset, it is necessary to differentiate certain terms that in common consciousness overlap or are confused. Morality, religion, and theology are not identical, and yet it is difficult to separate them. The difference may, perhaps, be stated concisely thus: They represent three aspects of human nature—religion is the feeling or longing for unity, the feeling of sin, the consciousness of imperfection, and the striving for harmony with the good. It is primarily emotional, not volitional or intellectual. Theology is the interpretation which the intellect gives; the formulating or the explanation of this feeling of incompleteness and striving for perfection. Morality, again, is the code of action and the actual living toward perfection as we conceive it, the holding of right relations to our fellow-men and to God. Theology gives the mental content to religious feeling, and morality is religion incarnate. A man may, then, be religious, that is, he may have the religious spirit, without believing in any creed

or dogma; and, indeed, so Professor Leuba says, without believing in a God, if he has this active longing for perfection, for a better than he. His theology may be science or philosophy, or any kind of knowledge whatever.

If we accept this general statement we can easily see that theologies and systems of morality will vary from age to age, according to public opinion and the progress of knowledge; but that the underlying religious feeling, the striving of the self toward a better self, will remain as the source or motive of all our theologizing and moralizing. Marshall, indeed, maintains that there is a religious instinct, an inborn desire to reach beyond one's petty self, and that this is the root of all altruism—the emphasis of the race as against the individual.

Froebel also maintains that the germ of the religious spirit exists even in the baby, in the feeling of community and dependence between himself and the mother; and Baldwin, voicing the opinion of many writers of to-day, looks upon the religious sentiment as the highest outgrowth of the ethical and social sentiments. We cannot, he believes, say properly that the little child is religious except as he is social. His first love, trust, and dependence are directed toward the people about him. Only later, and by slow degrees, does he learn to transfer these feelings to an invisible God.

Religious spirit and social spirit

In these relations to people he is developing more sense (1) of his own personality, and (2) of that of others.

In the religious sentiment, the first element gives content; the second, mystery and awe.

Thus we find that children interpret God and heaven in terms of their familiar experience, making oftentimes

the most grotesque and bizarre combinations. God is a big man and Satan a bogie, heaven is a glorified earth, and so all along the line. The little child looks on father and mother much as adults do on God, and relying upon them for help, learns his first lessons in religious trust and faith.

Child's images of God

So, also, the child may look upon any person or thing that is very strong as a god. Sully quotes the case of a little boy of four years who, on seeing a group of workmen, asked his mother if they were gods, "because they make houses and churches same as God makes moons and people and ickle dogs." The idea of God is, at first, only that of a person more powerful than others.

As the child's mind develops, he comes to look upon father and mother as the all-wise to whom obedience must be given and from whom knowledge may be obtained, but who must also, on occasion, be deceived or propitiated. God is, then, the great lawgiver.

The question of whether a child left without any religious instruction at all would form an idea of God, is difficult to answer, for all children hear more or less talk about religious matters. There is, however, a case of an uninstructed deaf-mute, M. d'Estrella, who formed for himself the idea of a "Strong Man behind the hills, who threw the sun up into the sky, puffed the clouds from his pipe, and sent out the wind when he was angry." It would be strange, indeed, if any reflective mind did not reach some idea of a cause of the world, and the first tendency is always to make the cause a person.

Effect of no religious training

Furthermore, we have already seen that little children are thoroughly animistic, that they naturally interpret everything going on about them in terms of personality,

so that objects and animals, to say nothing of the larger forces of nature, are looked upon as acting for or against the child, as meaning him good or ill. If they seem to be more powerful than he, fear and the attempt to propitiate are inevitable next steps, and then we have a form of religion.

Natural religion of child

We cannot, therefore, agree with Ames in his position that children before nine years cannot pass beyond the non-moral and non-religious attitude to any great degree. They cannot attain the adult standpoint and have the religion and morality of a mature mind, all would admit, but that is far from saying that they have no religion or morality. We may grant that their religion is superstition and their morality the relatively external condition of obedience and custom, but we may at the same time insist that the child who does not attain to these is in all probability defective or distinctly abnormal.

Dawson's position seems nearer the truth. He says that the natural religion of children consists of three chief factors—it is animistic, has belief in a personal cause, and has belief in personal immortality. Various returns show that children naturally assume that they never die, and that the first thought of annihilation is not only intolerable but hardly conceivable. We know how early in primitive religions dreams, shadows, echoes, and similar phenomena gave rise to the belief in a spirit world, the animistic mind seizing with avidity upon every evidence of continuance of personality. We may feel that this belief stands condemned by science, but we still have left the question of how we shall deal with it in the child without religion. Shall we bring him up in ignorance of the great race religion, the tremendous religious emotions and forces at work in every community, because we do

not approve the theological form they may have taken? Shall we leave reverence, inspiration, awe, and prayer out of his life because we are not sure there is an objective or personal God?

We have also one full account of the theological ideas of a boy brought up without religious training, whose parents were opposed to current religious ideas, but who was accidentally informed of religious matters by neighbors and occasional attendance at church. It is interesting as showing the effect of early surroundings in as marked a way as the other records to be quoted later.

Bergen's account

No religious instruction was given this boy, and he was not told his parents' belief until fifteen years of age; servants were warned not to speak of religious matters, no grace was asked at table, and all religious terms used in his presence were spelled. Naturally, he became very curious to know what the spelled words meant. He first went to church to an Easter service when seven years of age, but did not understand at all the symbolism of the spring-time resurrection. When ten years old he went for the second time to a Catholic vesper service, at which he was impressed by a large painting of Christ. When twelve years of age he was encouraged to go to church, but showed great distaste for it.

He knew something about death even when three years old, but had no fear of it until eleven, when a physical shrinking, which he did not outgrow for several years, manifested itself. He was unable to conceive of the soul as immaterial at ten years of age, and hunted for it in all parts of dead animals. At twelve, he said that the resurrection could not have happened, for in respect to death people were in the same condition now that they were two thousand years ago.

He grew very eager to read the Bible, because he noticed that people spoke differently of it from what they did of other books; but when a New Testament was given him, at the age of ten, he soon tired of it. At eleven, he explained the accounts of miracles as exaggerations of some real act of Jesus due to the repeating of it by one person to another.

When about fifteen years old he admitted that there must be some force or cause back of the physical world, but he maintained that we had no reason to say that this force was a *person*, and that it was belittling to worship a *thing*; therefore worship was senseless. Thus, the Gradgrind method produced the same results in religion as in any other field.

Child's attitude toward religious instruction

In the case of children who receive the usual religious training, there is an unquestioning acceptance of what is told them up to the seventh year. Between the seventh and the tenth year there are some questions, and after ten, attempts to reason things out, this critical attitude increasing to the thirteenth or fourteenth year. The spirit of doubt first shows itself in attempts to place the responsibility for statements: as, "The Bible says," "My father believes," and so on. Next come attempts to make the theological account square with actual life and with the child's own ideas of kindness and justice. The life of eternal song has not the attractions that life with a calliope or drum has. The injustice of sending the baby sister to hell-fires leads to rebellion against the entire system. Still, on the whole, there is little questioning from most children.

Starbuck,[1] who, with Barnes, has made the widest observations on children's theological ideas, finds the

[1] Starbuck's data include 330 children; Barnes's, 1,091.

following factors predominant in the child's religious life:

Factors	Girls	Boys
Credulity and conformity	3.1%	.5%
Doubt	5	5
Bargaining with God	4	2
God as talisman	5	5
God and heaven near	14	3
Love and trust in God	17	12
Awe and reverence	4	7
Fears	16	7
Dislike of religious observances	9	21
Pleasure in religious observances	17	7
Keen sense of right and wrong	22	15

We notice here, as usual, the unquestioning acceptance of statements made by parents or teachers as noted also by Barnes. This, Baldwin would doubtless refer to the child's feeling of dependence on parents. Again, the idea of barter and the small percentage of feelings of love, reverence, and fear, in Hall's opinion, seem to point to parents teaching that God is a sort of servant for the child. Barnes's papers show essentially the same thing. God and heaven are most common in thought; hell and the devil less so. The spiritual world is, in the main, pleasant, but is peopled with strange forms, doing unreal things.

Natural phenomena are hardly mentioned in relation to God. He seems to the child's consciousness wholly distinct from the world.

Children, as a rule, have very vague ideas about what God and Christ do, or what religious observance is for. One boy says God bosses the world, but usually they seem to think that the angels do the practical work. The relation of Christ to God is reversed in one fourth of the cases where he is mentioned, and in the majority of cases he is not even mentioned. The Trinity is spoken of by only two children out of one thousand and ninety-one.

The virtues which are most commonly considered necessary in order to get to heaven are: being very good, keeping the commandments, believing in God, loving God, praying, and so on,— all in the line of religious observance, and not at all of practical morality.

Religious feeling and moral sense in the child

Children do not name teachers as the source of their ideas, but parents, church, pictures, and the "hired girl."

If these reports are typical, it would seem that up to the age of twelve the child's theological consciousness consists, as a rule, simply of statements made by others and accepted without doubt; that the religious feeling is not yet separated from the feeling of dependence and mystery excited by parents and companions; and that the moral sense is only the sense of what custom demands. Shame is the shame of being found out, rather than of the doing of wrong, and the virtues possessed by the child are the result of imitation rather than of moral conviction.

Between the ages of twelve and sixteen, however, comes the great period of conversion, for this is the time when by far the majority of professing Christians join the church. If this does not occur before the age of twenty, at most, it is unlikely to take place later.

Conversion: average age

Starbuck's records show that out of three hundred and thirty cases in all, the average age of conversion for girls was between twelve and thirteen and for boys between fifteen and sixteen. A second period occurs between the ages of sixteen and eighteen. These cases are explained by the fact that many of those converted then had been partially converted two years before, but for one cause or another had become indifferent. The first of these periods, you will notice, is at the age of puberty, and it seems practically certain that the oncoming of maturity

is closely connected with conversion. It is the time when the physical nature develops the necessity of another for its perfection, and this need would naturally be reflected in the mental and emotional life in every way. The vague mental longings and questionings and unrests due to the rapid growth of association fibers in the nervous centers may be in large part satisfied by love of the ideal, and the hero-worship of which religion is one form. This close connection between mental and physical growth is shown also by the records of early conversion (71 per cent of women and 64 per cent of men). Such conversions are often due to overtraining or strong pressure (84 per cent and 73 per cent); but otherwise they seem to accompany early physical development (43 and 36 per cent).

Meaning of conversion

Coming now to the meaning of the term, "conversion" properly covers all awakening to the demands of the higher life and determination to meet them, whether the change be sudden or slow. Most writers agree in the following:

1. *The sense of sin.* This is found in 17 per cent of revival and 20 per cent of non-revival conversions, with or without religious training. If we include in this the fear of God as the Judge, with the resultant fears of death and hell, we must add 15 per cent and 16 per cent more to each of the above, making 32 per cent and 26 per cent, respectively. When the early life has been bad, this sense is, of course, more prominent, but it appears even when the worst sins are little faults. Professor Leuba says that fear is often taken for the conviction of sin, and that many such cases are complicated with bodily disorders, as hysteria, which add to the feeling. This period will be referred to again later.

2. *Self-surrender.* The yielding of self to the divine

will. This appears in 10 per cent of the men and 12 per cent of the women. It is usually preceded by much mental depression and meditation. Often there is violent resistance, wrestling with God, argument and doubt. This is much more prominent in men than in women—doubt registering with them 36 per cent as against 6 per cent in women. In a few cases this is followed by a determination to live a better life, but as a rule the order after self-surrender is hope, trust, and love, culminating in

3. *Faith* in 16 per cent of men and 15 per cent of women. The nature of faith has been much discussed by theologians, and we cannot expect to settle what it should be. In actual practice, it seems, more than anything else, to be the feeling of oneness with God and good, and the conviction that he is to be trusted. It is entirely apart from intellectual conviction, and is not, as a rule, belief in dogmas. It is not reasonable or reasoned faith, but, rather, an emotional state. It leads directly to

4. *Justification*, and the sense of forgiveness (22 per cent of men and 14 per cent of women), or the feeling of divine aid (10 and 6 per cent). Physiologically this is perhaps due to the inevitable reaction from the great nervous strain. We are speaking here of revival cases only. Any one who has seen a genuine old-fashioned revival cannot doubt that mere physical fatigue has in some cases much to do with conversion. A woman, for example, worked up to the highest nervous pitch by her emotions, gives way, and an attack of weeping and laughing with consequent relief follows, which is interpreted by her as knowledge of God's forgiveness.

5. As the natural result, there is a feeling of great *joy*. The world seems to be newly made. The whole

nature rises to a higher level, and in many cases (14 and 18 per cent) public confession and testimony to the power of the divine spirit follow.

6. The will is felt to be wholly powerless. The subject is carried on by a power outside himself. "Saved by the grace of God" expresses his state of mind. It seems to be to a large extent a struggle between conscious and unconscious factors, between habits which have passed below the level of attention and ideas which are as yet so vaguely felt as to be indescribable. It is again, perhaps, in large part the mental reflection of the bodily change—the opposition between the life of the individual and that of the race.

Between the two sets of forces the child's consciousness stands dismayed. He feels himself as clay molded by forces far more powerful than he, forces not only without him, but within him—how can he feel otherwise than helpless, and what hope is there for him if not in God?

Let us now take up in more detail the studies of actual conversions.

Conversion and education

In the first place it seems to be true that the nature of the conversion, for most people, depends to a large extent upon what is expected. Thus the denominations like the Methodist, that employ the revival method and teach the necessity of a sudden and absolute turning from sin, can show the most remarkable cases of reformation; while those like the Episcopalian, that look for a steady development of the religious life, are more likely to secure that.

Teaching, imitation, and social pressure in other ways influence 42 per cent of revival cases and 37 per cent of non-revival cases. We do not mean to say that they are the sole factors, but only that they are important.

Allowing, however, for preconceived expectations, we find that many who look for sudden conversion, and perhaps even desire and strive for it, are unable to attain it, while others get just what they expect.

Conversion and temperament

Professor Coe finds that out of sixteen subjects who expected conversion and were satisfied, twelve were in an emotional, as opposed to an intellectual, state of mind; eight of them had had hallucinations or motor automatisms of some kind, such as involuntary laughter or song, and many of them felt assured of special answer to prayer.

In another group, on the other hand, out of twelve subjects, who expected conversion and were disappointed, nine were in an intellectual state, only one had either hallucinations or motor automatisms, and very few had direct answers to prayer.

Under hypnotic influence, those in the first group are as a rule passively suggestible, while those in the second group, except in one or two cases, are suggestible, but are likely to add to or modify the suggestions in some way.

Taking now those who are converted, Starbuck gives the following:

Circumstances of Conversion	Men	Women
Revival or camp meeting	48%	46%
At home after revival	5	6
At home alone	32	16
Regular church	4	25
Circumstances not given	11	7

The motives of conversion have been touched upon slightly already, in giving social motives or objective forces, and the sense of sin. Other motives also enter in. Egotistic motives, such as to gain heaven, form 21 per cent of both revival and non-revival cases. These motives average highest in the

Motives of conversion

earlier years, diminishing up to the age of sixteen, then increasing up to eighteen, and thence declining. Love of God and Christ is mentioned as a motive in but 2 per cent of the cases, while love of a moral ideal is given in 15. The latter motive steadily increases in importance with the age of the one converted.

These motives ought to determine the character of the new life, and yet the percentages do not seem to agree in all cases.

Motive	Men	Women
Desire to help others	25%	25%
Love for others	43	42
Nearness to Nature	36	32
Nearness to God	48	47
Nearness to Christ	5	6

If love of God enter so little into conversion, it seems strange that the feeling of nearness to him should be so marked a feature of the new life, unless the desire for his approval is really more prominent before conversion than is indicated. Or, again, it may be that the mere feeling of relaxation, or release after the strain of expectation, is given this meaning.

Notice how small a part is assigned to Christ in these figures, obtained in nearly all cases from orthodox church members; and yet Christ is the central figure in the scheme of justification and redemption.

Gradual growth

Let us now consider briefly the religious life which is a gradual growth, without the storm and stress of conversion. Whether the development shall be gradual or not is to a large extent a matter of temperament, but gradual growth is facilitated by early religious surroundings and by freedom to raise doubts and wisdom in answering them. In such cases the belief in God, Christ, and immortality play a much

more important part than in cases of sudden conversion. The thought is not centered so entirely upon self.

In cases where the religious feeling was not aroused at puberty, some other strong interest takes its place. Usually this is the moral interest in 33 per cent of women and 43 per cent of men, but it may be intellectual (21 and 32 per cent), or æsthetic (15 and 16 per cent).

What now are the permanent results? In the cases of gradual growth, doubts are usually settled as they rise, hence the growth is as a rule a part of character.

Permanence of conversions

In cases of conversion, on the other hand, there is frequently a period of reaction and reconstruction of belief. The tables stand thus:

Result of Conversion	Men			
	Revivals	Age	Non-revivals	Age
Relapsed	48%	13.7	24%	17.5
Permanent	15	17	35	18.7

Result of Conversion	Wmoen			
	Revivals	Age	Non-revivals	Age
Relapsed	41%	12	14%	16
Permanent	14	14.3	17	15.3

This reconstruction may be, and often is, simply a new interpretation of religious beliefs, a more vital realization of the meaning of religion to the individual. It does not necessarily involve any break with the church, although the struggle is often a severe one. Or, again, it may lead to rupture. This period usually covers the period from sixteen to twenty years.

What, then, should be the religious training of a child? When should it begin? What should be formal and what

incidental? These and many other questions still await solution, although within the last ten years many books have appeared and many reforms have been made in Sunday school work in various places. For a general standpoint we can hardly do better than to follow G. Stanley Hall's chapter on Religious Training, in *Problems of Education.*

Religion in babyhood

To the baby the parents, and especially the mother, stand in the place of God. The feeling of absolute dependence, with the love flowing naturally out of the satisfaction of its needs, is the same that later should be felt toward God, and the more the mother and father cultivate love and gratitude toward themselves, the more naturally will the child feel them later toward the supreme source of all good. If the parents are wise, good, loving, the child will easily believe in a God that is so, but if they are capricious, governed by moods, or subject to the child's whims, his idea of God will be similarly defective.

Again, the very establishment of regularity, order, and law in all the details of the child's life is the most effective preparation for a later belief in universal law. This holds even of all the physical details—regular hours of eating, sleeping, and so on, but far more of the attitude of parents to children in matters of discipline and morality.

By the time the child is three or four years old he begins to ask questions about religious as about all other subjects, and the question of religious instruction becomes pressing. How shall we begin so that when the child is grown he need not with suffering unlearn what he now acquires? Certainly, we cannot leave a child uninstructed. He himself prevents this by his eager questions, and if we do not answer them, or if we give evasive answers, we get results very analogous to those resulting from

wrong responses to questions about sexual matters. The child will get information, and the real question each parent must ask himself and answer is whether he wishes to give the information himself or will risk the child's getting it from sources he deems undesirable.

We have already seen that early childhood is the age of fancy, belief in a living world, in fairies, and so on. We have not considered it necessary to shut out fairy tales and Santa Claus and Jack Frost; we give the child the Greek myths, and why should we not give him the Hebrew myths, telling these as we do the others so that the central meaning shall be true later to his reason? **In early childhood**

Again, stories of the childhood and babyhood of Christ, the nativity, the wise men following the star and worshiping the babe in the manger, the angels' song, and so on, appeal to little children as stories, and lay the basis for the intimate knowledge so desirable later.

Dawson's questionnaire returns on the interest of children in the Bible give some very interesting data. At eight years, interest in the Old and New Testaments was nearly equal for the boys — 60 per cent preferring the New; but 70 per cent of the girls preferred the New. A year later, however, interest is equal in Old and New, and interest in the New declines up to 32 per cent for boys at fourteen years and 30 per cent for girls at twelve years. Studies in other fields would lead us to suppose on other grounds such results. Children like stories of heroes, exciting events, speedy punishments, strict justice,— and all these are found in the Old Testament tales. In Dr. Hall's opinion, children's moral outlook is very similar to that of the Old Testament, and the God there depicted is the one whom they naturally worship. The love, pity, and self-sacrifice of Christ they **Bible interests**

cannot understand, and still less, of course, the Epistles and Revelation. If they are forced prematurely to these, not only do they become more or less hypocritical in religious expression, but they acquire mechanically from their elders forms of thought and expression which mean little and which later repress the normal growth.

Adolescent religion

At adolescence, however, when love and altruism and high ideals burgeon, when the sense of inadequacy of the pubescent easily deepens into the sense of sin, Christ and the Gospels take on a deep significance. We do not sufficiently appreciate the fact that Christ and his apostles were adolescents. At twelve Christ took up his mission, and he completed it when he had barely reached what we now consider maturity. The events of his life, and especially those of his death and resurrection, make a stronger appeal at this age than at any other, and may become the strongest motive for imitation and love. Here again, however, in Dr. Hall's opinion, the human side should predominate in the teaching.

Still later, the development of Christianity—that is, church history, the development of missions, the historical aspects of the Jewish religion, and so on—becomes interesting, as does also comparative religion.

Nature and religion

Along with this humanistic aspect of religion goes the natural side. The worship of Nature and natural objects is a deeply rooted tendency in human nature, and appears in the child in his tendencies to animism, in his belief in charms and superstitions, and in the reverential, awe-stricken attitude toward great natural phenomena so well described in Dr. Hall's chapters in *Adolescence*. The child should be out in the starry night, in winter and summer, alone, if possible. He should wander in the woods and muse on the clouds,

the shadows, the wind, and thus breathe in the infinities and spiritualities of space as his forbears did. To-day, in our endeavor that our religion shall be justified by its fruits, we are in danger of making worship nothing but work. The service of humanity, the institutional church, the belief in God as the great *socius* and in conscience as the product of social training—all these have done much good, especially in their rebound from the doctrine of faith without works. But with them religion must also have the factors of contemplation, awe, mystery, infinity, and eternity, and these it can get best from contact with Nature. God is more than the ideal companion; he is also the Eternal, which was before even the mountains were brought forth; he rides on the wind and speaks through the thunder. Conscience, too, though it take its form from its surroundings, bases itself upon instincts that antedate humanity, and the service of humanity itself would have no motivation were it not for instinctive feelings of which reasoning religion takes little account. It is an interesting fact that the great mystics, so called, have also been persons who excelled in good works; while the theologians have too often left the hungry still hungry and the wicked unrepentant.

Religion, then, to do its perfect work upon the tender child and the youth, must be allowed to adapt itself to their nature, and this means that it must be a growth like the child. In its early forms it will contain crudities and superstitions, and lack some factors which are necessary to its higher forms. But these will come by the way of natural development, if they are not prematurely forced.

Religion a growth

There are numerous practical questions in all directions which can barely be referred to here. One of the most puzzling to the parent who believes thoroughly in

immutable law is whether or not the child shall be taught to pray. Of course children do pray constantly to all those about them, just in proportion as they feel their dependence, and in the animistic stage of their mental growth it is inevitable that they shall pray to the God or gods in whom they believe. To teach them to pray aright is the parents' task—to so pray that the expression of their desires shall strengthen all the tendencies to good, their aspirations and ideals, and shall give them a conviction that the great forces of good in the universe are working with them. Nothing, on the other hand, can be much worse than to allow children to pray for material goods, for specific pleasures, for this makes God a special sort of servant who can be propitiated or bought.

Prayer

Again, there are the various problems connected with the Sunday schools, and with the matter of religious instruction in the public schools. Whether in this country it will ever be possible for Protestant, Catholic, and Jew to agree upon certain fundamentals seems doubtful at present. It may be that when we have a satisfactory scheme of moral instruction we shall find that the matter of religious instruction has also been solved. In the Sunday schools we find the most varied conditions. The sentiment is growing, however, that the teacher here should be trained for the work, and paid if necessary; that the work should be given systematically and in accordance with the best attainable knowledge, instead of being left to the inspiration and prayer of the teacher. The apparatus and methods of the secular schools in the way of maps, drawing, and so on, are being introduced, but just as in the public schools, we find them used at times in ways that are, to put it mildly, absurd. For these we must refer

School instruction

the reader to the special books given in the reference lists.

The teaching of the special dogmas of the parents' sect or religion is another difficult question, and perhaps hardly seems open to discussion by those who are ardent believers. But surely we cannot question to-day that the youth has the right to choose that particular sect which he feels most suited to his own needs, and that to force his childish thought into the mold of a given set of dogmas is a dwarfing of his soul. There is a justification for different sects in the needs of different natures, though these needs probably do not appear until adolescence. The youth should then have the opportunity to know the tenets of the different sects within Christianity, as well as of various religions. Tolerance should be a fact as well as an ideal.

Dogma

REFERENCES

Religious Ideas

Ames, E. S. *Psychology of Religious Experience.* Houghton, Mifflin, 1910, 427 pp.

Barnes, Earle. Theological Life of a California Child. *Ped. Sem.*, 1892, 442-448.

Punishment as Seen by Children. *Ped. Sem.*, Vol. III, 234-245.

Batten, S. Z. Church as the Maker of Conscience. *Am. Jour. Soc.*, 1902, Vol. VII, 611-628.

Beck, F. O. Prayer. *Am. Jour. Rel. Psy.*, Mar. 1906, 107-121.

Bergen, F. D. Theological Development of a Child. *Arena*, 1898, Vol. XIX, 254-266.

Brockman, F. S. Moral and Religious Life of 251 Preparatory School Students. *Ped. Sem.*, Sept. 1902, 255-273.

Brown, Daisy D. Young People's Ideas of the Value of Bible Study. *Ped. Sem.*, 1910, 370-386.

Brown, Marianna C. *Sunday School Movements in America.* Revell, 1901, 261 pp.

Butler, N. M. Religious Instruction in Education. *Ed. Rev.*, Dec. 1899, Vol. XVIII, 425-436. (Advocates longer S. S. sessions and paid teachers.)

Buy, Jean de. Stages of Religious Development. *Am. Jour. Rel. Psy.*, Vol. I, 7-29.

Calkins, M. W. Religious Consciousness of Children. *New World*, 1896, 705-718.

Chrisman, O. Religious Periods of Child Growth. *Educ. Rev.*, 1898, Vol. XVI, 40-48.

Religious Ideas of a Child. *C. S. M.*, March 1898, 516-528.

Clapp, R. G. New Departures in Sunday School Pedagogy. *Ped. Sem.*, 1909, 530-536.

Coe, G. A. Morbid Conscience of Adolescents. *Rept. Ill. Soc. for Child Study*, Oct. 1898, 97-108.

Dynamics of Personal Religion. *Psy. Rev.*, 1899, 484-505.

Studies in Religion. Methodist Book Concern, N. Y. $1.00.

Education in Religion and Morals. Revell, 1904, 434 pp.

Moral and Religious Education. *Rel. Ed.*, 1908, 165-179.

Religion of a Mature Mind. Revell, 1903, 442 pp.

The Spiritual Life. Eaton and Maines, 1900, 279 pp.

Collins, J. V. Religious Education of the Sunday School. *Ed. Rev.*, 1909, 271-283.

Cooper, E. H. Children's Prayers and Prayer Manuals. *Fort. Rev.*, 1903, 663-671.

Cope, Henry F. *Evolution of the Sunday School.* 1911.

The Modern Sunday School. Revell, 1907, 206 pp.

Cressey, F. G. *The Church and Young Men.* Revell, 1903, 233 pp.

Crozier, B. Problem of the Religious Consciousness. *Fort. Rev.*, 1902, 1004-1018.

Daniels, A. H. The New Life. *Am. Jour. Psy.*, Oct. 1893, Vol. VI, 61-106. (Significance of puberty with primitive peoples. Connection between adolescence and conversion.)

Davenport, F. M. *Primitive Traits in Religious Revivals.* Macmillan, 1905, 323 pp.

Dawson, Geo. E. *The Child and His Religion.* U. of Chicago Press, 1909, 124 pp.

A Boy's Religion. Y. M. C. A., N. Y., 16 pp.

Drawbridge, C. L. *Religious Education and How to Improve It.* Longmans, 1906, 222 pp.

Dresslar, F. B. *Superstition and Education.* Univ. Press, Berkeley, 1907, 239 pp. Bibliog.

Psychology of Superstition. *Am. Jour. Insanity*, 1910, 213-226.

Ellis, A. C. Sunday School Work. *Ped. Sem.*, June 1896, 363-412.

Ellis, G. H. Fetichism in Children. *Ped. Sem.*, 1902, 205-220.

Ellis, Havelock. Religion and the Child. *Nineteenth Cent.*, 1907, 764-775.

Gould, H. M. Child Fetiches. *Ped. Sem.*, 1898, 421-425.

Hall, G. Stanley. *Adolescence* and *Educational Problems*. *See* Index.

Hammond, E. P. *Conversion of Children*. Revell, 274 pp.

Hoben, Allan. *The Minister and the Boy*. U. of Chicago Press, 1912, 171 pp.

Hodges, Geo. *Training of Children in Religion*. Appleton, 1911, 328 pp.

Houghton, Louise S. *Telling Bible Stories*. Scribner's, 1905, 286 pp.

Hugh, D. D. Animism of Children. *N. W. Mo.*, June and October 1899, 450-453, 71-74.

King, Henry C. *Personal and Ideal Elements in Education*. Macmillan, 1904, 277 pp.

King, Irving. *Development of Religion*. Macmillan, 1910, 371 pp. Bibliog.

Koons, Wm. G. *The Child's Religious Life*. Eaton and Mains, 1903, 270 pp.

Leuba, J. H. Faith. *Am. Jour. Rel. Psy.*, Vol. I, 65-82.

Fear, Awe and Sublime in Religion. *Am. Jour. Rel. Psy.*, 1906, 1-23.

Psychological Study of Religion. Macmillan, 1912, 371 pp.

Religion . . . in the Struggle for Life. *Am. Jour. Rel. Psy.*, Vol. II, 307-343.

Psychology of Religious Phenomena. *Am. Jour. Psy.*, Vol. VII, 309-385.

Lowry, Eleanor. Concealed Neckwear of Children. *School Hygiene*, Feb. 1913, 38-41.

McMurry, Lida B. Children's Moral and Religious Conceptions. *Rept. Ill. Soc. for Child Study*, Vol. II, 23-24.

Marshall, H. R. Religious Instinct. *Mind*, N. S., 1897, 40-58.

Montgomery, C. Religious Element in Formation of Character. *Proc. N. E. A.*, 1899, 121-127.

Morse, Josiah. *Pathological Aspects of Religion*. 1906, 264 pp.

Okabe, T. Experimental Study of Belief. *Am. Jour. Psy.*, Oct. 1910, 563-596.

Patch, Kate W. A Child's Thought of God. *Kgn. Rev.*, 1906, 257-265.

Pratt, J. B. Types of Religious Belief. *Am. Jour. Rel. Psy.*, Mar. 1906, 76-94.

Psychology of Religious Belief. Macmillan, 1907, 327 pp.

Principles of Religious Education. Longmans, 1900, 292 pp. (Symposium.)

Ransom, S. W. Psychology of Prayer. *Am. Jour. Rel. Psy.*, Vol. I, 129-142.

Raymont, Thomas. *Use of Bible in Education of Young.* Longmans, 1911, 249 pp.

Robinson, V. P. Conception of God of College Students. *Am. Jour. Rel. Psy.*, Nov. 1908, 247-257.

Ruediger, W. C. The Period of Mental Reconstruction. *Am. Jour. Psy.*, July 1907, Vol. XVIII, 353-370.

Schroeder, Th. Religious Element in Public Schools. *Ed. Rev.*, 1909, 375-389.

Adolescence and Religions. *Am. Jour. Rel. Psy.*, April 1913, 124-148.

Seashore, Carl E. Play Impulse and Attitude in Religion. *Am. Jour. Theol.*, 1910, 505-520; *Assn. Sem.*, 1911, Vol. XIX, 235-241.

Starbuck, E. D. Study of Conversion. *Am. Jour. Psy.*, Vol. VIII, 268-308.

Psychology of Religion. Scribner's, N. Y., 1899, 423 pp. $1.50.

Feelings and Their Place in Religion. *Am. Jour. Rel. Psy.*, Vol. I, 168-186.

Stephens, Th. (ed.). *Child and Religion.* Putnam's, 1905, 311 pp.

Stratton, G. M. Psychology of the Religious Life. Allan, Lond., 1911, 376 pp.

Strong, A. L. *Psychology of Prayer.* U. of Chicago Press, 1909, 122 pp. Bibliog.

Subconscious and Prayer. *Am. Jour. Rel. Psy.*, Vol. II, 160-167.

Tanner, Amy E. Children's Religious Ideas. *Ped. Sem.*, 1906, 509-513.

Wallis, W. D. Element of Fear in Religion. *Am. Jour. Rel. Psy.*, 1912, 257-304.

Wilne, E. C. *Culture of Religion.* Pilgrim Press, 1912.

Woolston, H. B. Religious Emotion. *Am. Jour. Psy.*, 1902, Vol. XIII, 62-79.

For other excellent articles see *Journal and Proceedings of the Religious Education Association*, from 1906 on.

CHAPTER XII

Conception of Good and Evil

1. Tell the story of Jennie, and the box of paints (see section on Remedial Agencies in this chapter), and find what punishment the children would give. **Observations**

2. Ask the children whether it is "fair" for a teacher to punish the entire class for something that was done by a member of the class, but by which one she does not know.

3. To test the sense of property rights, ask the children: "If you found a sum of money on the school doorstep, what would you do with it?" The amount found should be varied in the different grades. It should not be too large for the child to understand what he can buy with it, or so small that he does not think it necessary to seek its owner. The place where it is found — the school doorstep — shows that probably the owner can easily be found. A different set of answers would be obtained if it were found in the street.

Writers upon moral training seem to be impressed chiefly with the faults and vices of the children to be corrected. This is natural enough, inasmuch as the "good" child offers no problem for solution. On the other hand, in so far as we lack knowledge of the positive morality to which a child normally attains at various stages, we must also lack correct standards by which to judge him. Sometimes we shall demand things which he is too immature to do, while at other times we shall be over lenient,

and if by chance we give the right word at the right time, we shall also by chance do him irreparable harm. It is of course difficult to ascertain what sense of right a child would have who was brought up in entirely normal surroundings by entirely reasonable and loving parents, and perhaps such knowledge would have little practical value. We must try here rather to reach something of a norm or type by various indirect means.

Goodness vs. adult convenience

First of all, a clear distinction should be made between genuine goodness and what is convenient for teachers and parents. Sitting still in school and keeping his clothes clean are two points very important to the comfort of teacher and parent, but to call their opposites faults is surely a misnomer. At the best they are bad necessities for the little child; smaller evils to avoid greater ones, and the child's failure should not be counted against him, but against the system which makes such demands. In the long lists that have been made of children's faults—so much longer than the lists of their virtues—such items predominate.

True faults, on the other hand, are those that point to defect in the child, which, if uncorrected, will lead to vice or crime later on; true goodness or virtue at any given age is the state from which will develop the personality devoted to moral progress and ideals. Here too we must admit the fluctuating estimates of goodness or virtue from age to age and nation to nation, even in fundamentals. We cannot discuss here the nature of virtue in itself, but will only attempt a rough estimate of childish development under good conditions.

From the very beginning of the child's life his world falls into three rather definite classes—the world of objects; of other persons; of self. Other persons, perhaps, are at first only objects, but at a very early stage

the mother, at least, assumes a specific character, and if there is a genuine social instinct persons are from the beginning interesting in a different way from objects. We have also noted that from the very beginning the child reacts in rather definite ways to certain classes of objects — reaching for the pleasure-giving and avoiding the pain-giving in their various forms and at their different levels of complexity. Some moralists may dispute that this is the germ of morality, but whether or not it is, it is assuredly the point of attack for the mother who wishes to teach her child.

The baby's goods

For the baby, as we have seen, the great goods of life are food, warmth, sleep, and opportunity for free exercise of his senses. His great interests are in securing these, and because they come to him in connection with persons, all of them are bound up with social reactions. Is there anything moral in his attitude? Certainly very little in the ordinary sense of the term. It is self-evident that a baby can know nothing of the right and the wrong attitudes toward self, others, and the objective world. The most that it can know is, after a little, that this act brings it pain and that pleasure, and (including here also deprivation of goods, approval or disapproval, and so on, as well as mere physical pain and pleasure) the best that it can do is to avoid the one and secure the other.

Normality and morality

The inborn factor of morality is normality. The baby born normal in body and mind and developing normally has every opportunity to become normal morally. For such a baby, the basis of morality is the forming of good physical habits, and at the beginning this rests entirely with the mother. By two or three weeks after birth some habits have become grafted on instincts so that the child feeds,

sleeps, and lies in ways that tend toward health or the opposite, and toward self-control or the opposite. Any slight deviation from health which makes him fretful and leads to more attention than he gets ordinarily is the vantage ground for forming wrong associations. Similarly, any cause whatever which leads to irregularity in his habits—visitors, or a trip from home—may end in indulgence and over-assertion. If, on the other hand, the mother lays down wise habits and customs in all departments of the baby's life, they become pleasant, both in themselves and on account of the social approval constantly associated with them, and the child very soon carries them on automatically and, later, imitatively. In this early stage the "good" child is only the unconscious reflection of the good mother; and the "bad" child the reflection of the bad mother.

Obedience

When he is old enough to understand gestures and inflections of approval or disapproval, the conflict between his social nature and various instincts begins, and may become very acute and difficult to solve if the mother is unwise. Here obedience may and indeed should begin, but, on the other hand, the mother should demand only what is within the child's power at the time the demand is made. His virtue depends to a large degree upon his health, hunger, fatigue, or other condition, as well as upon his understanding what she wants and upon his control of his body. No one would require a year-old child to thread a needle, but we ask other things just as impossible. With the child who understands his mother's wishes, we may say perhaps, that virtue consists in his effort to carry them out, that is, in the attitude of obedience. She may be teaching him habits that later on will be classed as faults, —impertinence, slapping—to say nothing of bad habits

of eating and sleeping, but in doing what she wants he is following the highest good he knows. If what she wants could but be the same as what the progress of humanity needs, the child would indeed be blessed.

As the child gets older, as he understands language and sees other children and other people, as his desires develop and he becomes more able to gratify them if left to himself, obedience becomes harder and the problem of exacting it greater. Some moralists would insist that a child should obey without question; others would explain everything and demand only obedience to reason. In all probability the normal child develops from one to the other, and in all the stages between babyhood and maturity command and explanation must be judiciously mingled. If parents themselves be reasonable and kind, children usually obey. The importance of obedience as laying the basis of respect for law can hardly be overestimated, but we must never forget on the other hand, that forced obedience to unjust law breeds a sense of injustice and a desire for revenge that go far toward making criminals.

The development of the sense of law is shown in the penalties children would attach at different ages to a wrong act. At seven years 89 per cent would punish regardless of the legal penalties; at twelve 29 per cent, and at sixteen 74 per cent.

Conscience and the sense of honor, however, seem to remain relatively undeveloped before puberty. The child's morality at all ages before puberty, therefore, is motivated from the outside more than it is from the inside; is a matter of custom rather than of ideals. The best preparation for the inwardizing of morality is, therefore, as has already been said so many times, to train him in good habits

Conscience

in every possible direction. Hall goes so far as to assert that it is wrong to put too much responsibility upon children for their own acts. They are at this stage docile. They are disciples, not masters. He believes that they both love and respect most the one who demands obedience, and that under most circumstances they would rather obey than order their own lives.

Attitude toward the truth

In the chapter on Imagination we have already shown how a child may invent a lie in order to escape from an unpleasant situation, just as he invents means of obtaining bread and jam. There is in this at first no perception of the moral wrong, but only the instinctive shrinking from pain. To cure the child, therefore, we must bring about two things: (1) Make him brave enough to take the consequences of any act of his; and (2) make him realize the self-contradiction and doubleness involved in a lie. Sometimes it is said that a child should never be punished when he confesses any wrongdoing. Such a course must breed in a child a belief that there is no natural penalty for wrong, and must end in more or less contempt of the law that can constantly be overridden if only the transgression is admitted. Rather, so high a fearlessness and honor should be cultivated that a child who has done wrong shall present himself for punishment.

Plato says somewhere that if man did but know his highest good, he who had broken the law would hasten to the judge for condemnation and punishment as a sick man goes to his physician for medicine. So, in all our dealings with a child, even if pain be needful, every act and word should declare to him that our only purpose is to heal his moral sickness, and to increase his moral health. We all know that children can be very brave under the physical pain inflicted by a physician if they

understand the necessity for it. Surely they will be no less brave under the pain resulting from their wrongdoing, if there also they see the need of it. Lies offer little temptation to a child who holds this attitude toward pain. But most of us are too cowardly ourselves to inculcate true courage in our children. We ourselves prevaricate and falsify under slight temptation, and we can expect nothing else from our children.

Teasing, bullying, cruelty

In all probability there is at first no intention of inflicting pain in bullying and fighting. Burk believes that they are survivals of acts useful to an earlier civilization. That is, they are instinctive, and have no consciously defined purpose behind them. Probably curiosity to see how the victim will act also enters in, as it does in the case of many apparently cruel acts. In such cases there is a double remedy. First, the child's sympathy should be aroused for the victim by leading him to imagine himself in the other's place, or, if he cannot imagine it, by actually putting him there. A little bullying and teasing of the bully, accompanied by remarks to show that the pain he suffers now is only the pain he himself has inflicted on others, will often cure him. In the second place, replace the bullying, teasing, and cruelty by other acts, if possible by kind acts, toward the victim; but if that is not possible, by constant occupation in work and games where there is no opportunity to indulge this propensity. As to fighting, it is doubtful whether a fair fight leaves any bad moral effects, and does not rather square up grievances in the most satisfactory way to the persons concerned. There are, of course, boys who will brood over a defeat in a fight and will be induced by it to use underhand means the next time, but such a disposition is sure to come out in other directions also, and must be combated all along

the line. The only way of knowing whether a boy has been benefited by a fight is to see how he feels toward his opponent. The parent's action can be safely guided by that.

The good and the bad

The moral ideas of children are concerned chiefly with concrete acts. A good girl or boy is usually one who minds the mother. At a great distance after obedience comes truthfulness, 29 per cent as against 54 per cent. Is it not a sad commentary upon us, that we should impress obedience upon children so much more diligently than truthfulness?

Attitude toward possession

There is an English proverb that "possession is nine points of the law," and another that "finders are keepers." Little children tend instinctively to act upon these proverbs. The one who first gets a thing has the right to it against all others; and, with the youngest children, this feeling of ownership sets aside any previous ownership. The little child does not make the distinction of thine and mine. "Mine" is whatever he wants, and when he does not want it, he may or may not feel a sense of ownership. With kindergarten children the plea that they "had it first" seems to override the argument "It's my turn," especially if the turn is something left over from the day before. There is a tendency to start each day with a new account of rights.

The property sense is relatively undeveloped, therefore, and remains so for a long time. Among juvenile offenses, offenses against property and stealing food lead all others. It is very difficult for a boy to feel that he has no right to a few apples, or that he may not enjoy himself in a private park or cross a lawn on his way to school. Property of his own does much to develop this sense, and it is desirable that within certain limits children shall have

their own toys, places to put things, and so on. But we must also avoid making a child selfish and over-individualistic.

Children's ideas of justice reflect their feeling that the right is the customary. Unusual punishments are more likely to be resented than more severe familiar ones. Feeling plays a large part, according to Kline's returns from 2,384 eight-to-eighteen-year-old children. **Justice**

Miss Schallenberger told two thousand children from six to sixteen years old this story: "One afternoon, six-year-old Jennie's mother went out to call, leaving Jennie playing with her box of paints. After a while Jennie went into the parlor, and saw there some nice new chairs. She exclaimed, 'Oh, I will paint all these chairs, and mamma will be so pleased!' When her mamma came home she found her chairs all spoiled. If you had been her mamma, what would you have done to Jennie?"

The punishments assigned fell into three classes.

1. *The principle of reprisal.* Jennie gave her mother pain, and so she must suffer pain. The little children advocated this far more than the older ones, for they thought only of the act, not of the motive. At six only 23 children speak of Jennie's ignorance; at twelve, 322, and at sixteen, 654. So, also, none of the six-year-olds would tell Jennie why she was wrong; at twelve, 181 do, and at sixteen, 751. The specific punishment assigned is usually a whipping, but this lessens from 1,102 out of 2,000 at six, to 763 at eleven, and 185 at sixteen.

2. *Prevention by fear or terror.* None of the six-year-olds would threaten; 39 at twelve and 85 at fifteen would. None of the six-year-olds would make her promise not to do it again; 15 at twelve and 35 at fifteen would. Notice how very small this class is, both as to threats and

promises; and yet there are no more common methods than these two in dealing with children.

3. *Reform.* As we have already said, explanation of why Jennie's act was wrong increases steadily up to the age of sixteen. The idea of reform becomes more prominent, but even at sixteen it is not as prominent as the idea of revenge is at six. The older children are more merciful than the younger.

Now consider in connection with this the reminiscences by young people between seventeen and twenty-one years old, given by Street, of punishments that did good or harm.

Just or unjust punishments

Under punishments that did good we find the following list: Sixteen were helped by whippings, of which they speak with gratitude; eleven by withdrawal of some privilege; six by talks; five by being left alone a time; four by scolding.

Harm was done to eight by whippings; to eight by undeserved punishments; to four by sarcasm; to four by talks; to three by forced apologies; to two by public punishments.

These numbers are small, and must be supplemented by Barnes, who collected two thousand papers describing just and unjust punishments, from children between seven and sixteen years old. Two and a half per cent of these two thousand children cannot recall any just punishment that they have received, but we are left ignorant of their character and surroundings; 25 per cent cannot recall an unjust punishment; 42 per cent of those who think punishment just, can give no reason, and 12 per cent think that it does them good, although they do not see how. In such cases, there seems to be an unquestioning acceptance of custom. Where reasons are given, the most common idea is that of atonement, the expiation of an offense by pain.

Of those who felt some one punishment unjust, 41 per cent gave as a reason that they were innocent of the offense; 27 per cent that they could not help it, forgot, did not know better, did not intend to, etc.; 19 per cent admitted the offense, but thought the punishment too severe, due to prejudice, etc.; 11 per cent maintained that the act for which they were punished was right, and 79 per cent threw all responsibility on the one who punished them. Injustice is, on the whole, charged about equally against parents and teachers, but as children grow older they talk less about home matters.

The ideas of what punishments are just and what are unjust are very vague, even among the older children. The forms about which opinions commonly differ are: scolding, confinement, and whipping. Six hundred and eighty-one whippings are called just, as against 493 unjust.

Finally, the results of investigations to determine whether children admit the justice of making the innocent suffer with and for the guilty are rather surprising. This case was presented to nearly two thousand children from seven to sixteen years old: "Some children in a class were bad, but the teacher could not find out who they were, and so she kept the whole class after school. Was she just?" Out of these 1,914 children or 82 per cent considered her justified, and the percentage was nearly the same for all ages.

The reasons given for this decision were various. Forty-nine per cent claimed that it was just because the class would not tell on the guilty ones, evidently believing that the class as a whole is at least partly responsible for the good behavior of each member. Sixteen per cent said that the class was bad; 10 per cent, that the teacher did not know the guilty ones and must punish some one; 5 per cent, that it was a sure way of punishing the

offenders, and 4 per cent that it would prevent a repetition of the offense. The feeling that the class should coöperate with the teacher in keeping order increases to over 50 per cent after the age of ten.

How then, do children feel toward punishments?

Summary

1. Little children are much more prone than older ones to consider only the act, and not the motive; to punish for reprisal; to inflict physical pain; to give no reasons.

2. At no age do children consider threats and promises of much importance.

3. Practically all children accept most punishments as just; but many consider some one or a few unjust.

4. What is just is very vague, and is probably almost the same as what is customary, especially with the younger children. Under unjust punishments, for instance, violation of custom, either by punishing the innocent or helpless child, or by exacting an unusually severe penalty, covers nearly all the cases.

5. The most common punishment is whipping or spanking. Among children of all ages, 681 whippings were considered just, as against 493 unjust. As far as these records go, children do not seem to feel that there is any greater indignity in a whipping than in any other form of punishment.

6. Most children admit the justice, though on various grounds, of punishing a class for the misbehavior of some unknown member.

Honesty

The standards worked out in daily life among boys and girls eleven to fifteen years old are rather rough and ready and vary considerably from child to child. In my own returns from 615 children it appeared that 75 per cent would not tell on a playmate; 71 per cent would not cheat in a game; 71 per

cent would return a lost article if they knew and did not like the owner, while 92 per cent would do it if they liked him; 45 per cent of the boys and 18 per cent of the girls would put bad money in a slot machine; 52 per cent of the boys and 5 per cent of the girls would pass it; 23 per cent of the boys and 12 per cent of the girls admitted that they would cheat in a game.

Among college girls the standards also are rather different from those of the developed and sensitive conscience. According to returns from 440 girls in various colleges, 40 per cent would keep their street-car fare if it were not collected; 50 per cent would run the risk of being called on if unprepared in a lesson, and if partly prepared, 67 per cent would "bluff"; 50 per cent would exaggerate to give zest to a story; 65 per cent would tell a white lie to save people's feelings; 37 per cent would tell a credulous girl outlandish stories, and 57 per cent would allow a person to think too well of them. In the matter of examinations, under the honor system, 69 per cent would avoid a girl known to cheat so that they would not have to report her; 52 per cent would report her if necessary; 27 per cent would use a point seen accidentally on another's paper. In the daily lesson work, 21 per cent would use a "pony." In a considerable number of cases love and sympathy are felt to be of more value than truth, and virtue comes more easily in relation to people liked than to those disliked. The response of girls at this age to being put on their honor is both ready and complete, and the moral sense is in a nascent stage that makes them very open to suggestion.

In general, then, we cannot expect from children or even from adolescents a highly developed sense of right

and wrong. The unconscious lack of discrimination between the good and the customary, and still more between the evil and the violated custom, is very evident and very suggestive to one who gets on familiar terms with children. The responsibility for establishing right customs and for leading from them up to right thinking and right ideals must rest upon the parent and teacher, and here loving authority is the chief agency for securing the desired results.

Turning now to the other side, we find a long list of faults for which children receive punishments, made by Sears on a thousand children, as follows: For disorder, 17 per cent; disobedience, 16 per cent; carelessness, 13 per cent; running away, 12 per cent; quarreling, 10 per cent; tardiness, 7 per cent; rudeness, 6 per cent; fighting, 5 per cent; lying, 4 per cent; stealing, 1 per cent. He gives a long list of punishable offenses, for which, however, the percentages are very small —malice, swearing, obscenity, bullying, lying, cheating, untidiness, insolence, noisiness, injury to books, property, etc. In Triplett's census of faults named by teachers inattention led all; then come defects of sense and speech, carelessness, indifference, lack of honor and of self-restraint, etc. In the census given by parents, willfulness and obstinacy led, then teasing, quarreling, dislike of application and effort, etc. The children of these parents and teachers, on the other hand, put fighting, bullying, and teasing first; then stealing, bad manners, lying, disobedience, truancy, cruelty to animals, etc. The contrast is striking, and should surely make us question the reasonableness of our standards of good and bad children.

Faults

When we consider juvenile crime—offenses punishable by law—we find that Morrison estimates that of children under fourteen who are sent to corrective institutions,

more than half go for such offenses as truancy, begging, incorrigibility, and refractory disposition, that is, for offenses with a strong element of vagrancy; while of children from fourteen to sixteen years of age hardly one tenth go for such offenses, but with them theft leads, with offenses against property. From sixteen to twenty-one, crimes against persons lead, and serious offenses, such as burglary and house and shop breaking, are four times as common as below sixteen.

Juvenile crime

When we turn from this brief consideration of the virtues, faults, and crimes of children to the question of how to secure the former and prevent or cure the latter, we find that perhaps the most important problem, as it is assuredly the first, is that we should take ourselves in hand. Not only should our own lives exemplify the goodness that we demand of children, but we should have such knowledge of child nature as to realize that they are less developed morally, as they are intellectually and physically. These are trite sayings, but they need reiteration in view of the numerous schemes for formal instruction, the special devices, and so on, which, it is often tacitly assumed, will supersede the fundamental method of daily example and training. These schemes are legion, and would need volumes for their elucidation. Let it be said that undoubtedly each has done good under certain conditions, and for certain types of children, but that no one can possibly cover the whole field. Each will fail in certain directions, under certain conditions, with certain children, and the most important task of those in charge of the young will be the same in the future as in the past—namely, to know the complexity of each child's moral nature and to apply all sorts of stimuli and aids, from lowest to highest, as seems best in each individual

Moral reform first of adults

case. Rarely is a bad child bad from any one cause. Mind and body, instinct and training, habits and desires, are interwoven so that a moral stimulus at almost any one of these points will affect all the others to some degree, while defect at any one point inevitably modifies the rest. Let us consider some of these factors that irradiate in all directions, and first among them good health and good physical conditions generally.

Physical conditions

Henry Ward Beecher once said, wittily and wisely, that if he could but be born right the first time he would be willing to take his chances on the Second Birth. Modern Christianity marks its sense of the relation between the physical and moral by sending medical missionaries to the heathen and visiting nurses to the poor of the slums. It has been abundantly proved that the moral tone is somewhat lowered by fatigue and that the habitual criminal usually has some bodily defects. The first thing necessary, therefore, for a healthy, moral nature is a healthy body. The moral education of a child begins even before the marriage of his parents, in their cultivation of right habits of living.

Everything that contributes toward making the child well-born physically, and toward keeping him so, is a factor in his moral education. Here, and here alone, is the justification for the expenditure of the best thought and energy upon the science of hygiene, including cooking. Such matters as the healthiest food for a meal and the healthiest way of cooking it, the clothing, and the ventilation of the house, assume from this standpoint the aspect of important moral duties. The child who is born healthy and kept healthy by good food, good air, and good clothing has the basis of a sound morality.

Hall says that a good table is one of the best preventives of stealing, and we know that playground and

recreation centers have lessened juvenile crime by giving opportunities for boys and girls to gratify their natural instincts without coming into conflict with the law.

Our treatment of juvenile offenders reflects this point of view. More and more it is understood that a large proportion of boy and girl criminals are either feeble-minded or defective in some way, or else are the victims of poverty or vicious home conditions. If the mother goes out to work there is more chance of the children coming into the juvenile court. If the children are poorly fed they naturally pilfer food as they get the chance, and the child who steals food easily develops into the youth who steals money and breaks into houses or stores. Such children can usually be reformed by supplying the physical needs and the proper supervision, but the defective child also needs some medical attention which will reform the defects, or else he is so defective in brain development that he cannot with our present knowledge be cured. We have already referred to moral aberrations due to the effects of adenoids, or even to bad teeth, and elsewhere have briefly discussed the "moral degenerate."

After the utmost has been done for the physical health of the child, the establishing of hygienic habits both of body and of mind comes next. Hygienic habits of eating, sleeping, bathing, dressing, may and should be so automatic that they are rarely in the child's consciousness, and the same should be the case in all the matters of daily social intercourse.

The struggle between right and wrong occurs in most of us because our feelings are opposed to our duty or our reason, and it could be in large part transferred to a wider sphere if we had been properly trained in small matters.

It is pitiable to find a child of ten or eleven years constantly disciplined for slight discourtesies, for indiscriminate eating at meals and between meals, and for cruelty to weak things. His moral struggles at this age should come in the resistance of temptation to active wrongdoing. Such a condition is usually the fault of the parent, who neglected these matters when the child was little. From the very beginning of life, only courteous tones, gestures, and acts should surround the child, and be expected of him, as a matter of course. Good breeding, which includes all the lesser moralities, should be so habitual as to be unconscious. Then a child can turn his attention entirely to the more serious moral questions that each of us must some time decide.

Good breeding

In the solution of these, however, we pass from the realm of habit and custom to that of ideals and volition. We have already seen how dependent children's ideals are upon their environment, and so in the decision of these questions a child's greatest safeguard, especially between ten and eighteen years of age, lies in a close friendship with some older person,—parent, teacher, or friend. Such a friendship brings about naturally the free discussion of serious moral problems and allows a child to receive with an open mind the opinions of his elders. Both for the prevention and the correction of evil tendencies such a relation is of the greatest value. Parents should, therefore, make every effort to retain the confidence of their children, and teachers should consider the securing of that confidence as important as their class teachings.

Friendship

Here, also, there is much difference of opinion as to the value of discussing moral questions. More than a few high-school teachers assert that talking does only harm, because it hardens children and makes them hypocrites.

On the other hand, we have some direct testimony from boys showing that they were greatly helped at a critical time by a friendly talk.

It is possible here, as in everything else, to approach a child in such a way that a discussion will only harden him, but surely we cannot assert that a kindly, fair, and reasonable presentation of a moral question, with opportunity on the child's part for reasonable objections, will either harden him or make him hypocritical. He must have had sad experiences with other adults if this is the effect upon him.

The writer believes, on the other hand, that there is serious danger in leaving a child to form his own opinions of right and wrong. He has not the ability to generalize with certainty, or the experience upon which to base a correct judgment, and it is our duty to supplement his defects without forcing our opinions down his throat. This teaching is not best done by formal instruction, but in the evening or Sunday talks that every wise mother has with her children. At such a time, specific examples—this time when John got angry, and that one when Mary told the fib—will come up of themselves, and can be seen in their true light by the children. Such talks show the children where they must learn self-control, and make them feel that all of the family are helping them.

School instruction

The value and the method of formal moral instruction in school is a much disputed question. France has a highly developed system in all her public schools, but it has not yet been established long enough for its virtues and defects to be beyond question. They would surely not appear distinctly until the second generation had been trained, and all the feeling roused by the separation of church from state had died out. We can hardly doubt, however, that formal

instruction must to some degree raise the ideals of children and create at least something of an *esprit de corps* in goodness, especially if there is anything in the nature of public approval of good or heroic acts by individual children. The dangers in such a method are of at least two kinds. One is that parents and teachers will rest satisfied with mere word instruction, and will give up actual training. The other is that the children will be made too self-conscious, and that the natural tendency to do good for the sake of approval will become over strong. Again, instruction on the details of morality is likely to become platitudinous if not absurd, and thus lead to depreciation of it by the children.

Instruction, however, that puts before the children heroic examples suited to their years, that inspires them with enthusiasm and love of these heroes, whether they are obtained from biography and literature, the theater or moving picture, or the daily paper, is of great value. All these means, it must be understood, are subsidiary to the great end of developing high ideals and noble ambitions in the child by precept and example. A morality that is merely habitual is better than none, but is only the basis of a morality that is shaped and modeled by the power of a living, glorious devotion to the highest aims. The parent or the teacher who can by any means inspire a child with a love of the good, the beautiful, and the true, with the ability to see them in the lives about him, and with a willingness to sacrifice himself for the sake of them has done the utmost.

Ideals

The discussions of the best methods of reforming a bad child differ as much as do those on prevention. Certainly we cannot agree with those who seem to believe that every error leaves a permanent stain on character. On the other hand, the doctrine that a child must be

vaccinated with badness in order to become immune to its more severe forms, seems a dubious pedagogical position. There is of course an element of attractiveness in the unknown and forbidden, and certain crudities natural to children are naturally outgrown, as we have said so many times. It is also true that strength is gained by overcoming temptations not too great, and no wise guardian would isolate a child in order that he might never fall. Victory often comes in its best sense after defeat, and sympathy and love for sinners can only be felt by those who know their temptations. Average—shall we say normal?—humanity stumbles more or less in its upward path, and perhaps one of the best lessons a child learns is that he will fall and then if he does not get up he will be forced up in the same path as before. As he gets praise, reward, and social approval in various forms when he does well, punishment and condemnation should come when he does ill, as soon as we are sure that his failure is due to remediable defect in his ideals or his will. The most important single factor here is that the punishment shall be as inevitable as natural law. Then it can be relatively slight and still work.

1. *Punishment as a Logical Result.* Spencer formulated the doctrine that the reasonable punishment of a wrong act is its own logical result, and that the punishment given by parents or teachers should simulate this natural one as far as possible. The theory is excellent as far as it goes, but there are many wrong acts in which the consequences are so far removed that the child cannot of himself see the connection; and there are others where the effect for the time being is slight, and not painful; and there are still others in which deformity or death would result. As an example of the first we may take the habit of lunching three or four times between meals;

of the third, careless playing with a sharp knife. We cannot, in any such cases, leave the child to learn by the results, and so we supplement Nature by the second method—moral suasion.

Scolding

Moral suasion as a means of prevention or instruction we have seen to be of great importance. When the offense has already been committed it takes a more strenuous form, putting vividly before the child what he has done and its effects upon his own character and upon the opinion that people hold of him. Hall gives a very concrete presentation of the value of a good scolding in bringing home to a careless child his fault, provided that the scolding does not degenerate into mere nagging and whining. The authoritative character of the one who scolds, and his fundamental reasonableness, make his condemnation of the child dreadful, especially if it is given with some anger, as Hall thinks it should be. Hall is distinctly opposed to the theory that we should never punish in anger. Rather, he thinks, we should be sure that our anger is righteous, and use it for an additional stimulus to the offender.

Whipping

If the various agencies for prevention, instruction, persuasion, disapproval, and scolding, and perhaps deprivation of various personal and social privileges, do not effect a reform, fear of physical pain seems the only resource. We may admit that the failure of other means points to defect either in the child or in ourselves, but we should also remember that physical pain has been a great educator in the history of humanity, and that in such forms as fighting and dueling it is still the way in which many even civilized people punish offenses. The evidence already quoted from children shows that the younger ones have no such sense of personal injury when they are whipped as some

older people have, and probably we should find great variations even among adults. Certainly among some classes of our population husbands beat their wives and wives slap their husbands without more than rippling the surface of the sea of matrimony.

Such an appeal to physical pain is, of course, a low-grade stimulus, and may become brutalizing if too frequent and too severe. On the other hand, if administered as a last resort and made the basis of an appeal to the child's imagination in the future, it may arouse a fear that will be the beginning both of moral wisdom and of self-control. Before puberty it is not likely to arouse any lasting anger in a child, unless the conditions are very exceptional.

REFERENCES

Addams, Jane. *Spirit of Youth and the City Streets.* Macmillan, 1909, 163 pp.

Adler, Felix. Punishment of Children. *Jour. of Ed.*, 1906, 402, 454, 481, 540, 596.

Moral Instruction of Children. Appleton, N. Y. $1.50.

Barnes, Earl. *Studies in Education*, 26, 71, 110, 149, 190, 270, 299. U. of Chicago Press, Chicago. (Tells how to collect and use material.)

Student Honor. *Int. Jour. Ethics*, 1904, Vol. XIV, 481-488.

Bettenweiser, Ellen C. The Obstinate Child. *Ped. Sem.*, 1911, 315-328.

Briggs, Le Baron. *School, College and Character.* Houghton, Mifflin, 1902, 148 pp.

Routine and Ideals. Houghton, Mifflin, 1904, 232 pp.

Brown, E. E. *Government by Influence and Other Addresses.* Longmans, 1910.

Naughty Children. *Proc. N. E. A.*, 1899, 564-570.

Brownlee, Jane. *Moral Training in Public Schools.* Holden, Springfield, 1908, 29 pp.

Bruce, Hortense V. Moral Degeneracy. *Jour. Psychoasth.*, Vol. XIV, 1909-10, 39-47.

Bryan, E. B. *Fundamental Facts for the Teacher.* Silver, Burdett and Co., 1912, 137 pp.

Bryant, Sophie. *Teaching Morality.* Macmillan, 1897, 146 pp.
Short Studies in Character. Macmillan, 1894, 347 pp.
Buckbee, Anna. Primary School and Development of Character. *Jour. of Ped.*, 1907, 214-230.
Buisson, F. Education of the Will. *Rept. U. S. Com. Ed.*, 1902, 721-740.
Bulkley, J. E. Social Ethics in the Schools. *Forum*, Jan. 1899, Vol. XXVI, 615-620.
Burbank, Luther. *Training of the Human Plant.* Century Co., 1907, 99 pp.
Burk, F. L. Teasing and Bullying. *Ped. Sem.*, 1897, Vol. IV.
Cabot, Ella L. *Everyday Ethics.* Holt and Co., 1906, 439 pp.
Ethics for Children. Houghton, Mifflin, 1910, 262 pp.
Call, A. D. Growth of Moral Ideal. *Ed.*, May 1912, 546-59.
Carrigan, T. C. The Law and the American Child. *Ped. Sem.*, 1911, 121-183. (A digest.)
Carus, Paul. Moral Character of Children. *Open Court*, 1899, 176-184.
Chambers, W. G. Evolution of Ideals. *Ped. Sem.*, 1903, 101-143.
Children's Attitude toward Rewards. *Paid.*, 1901, 22-28.
Chubb, Percival. Direct Moral Education. *Rel. Ed.*, 1911, 106-113.
Clapp, H. L. Self Government in Public Schools. *Ed.*, 1909, 335-344.
Clark, John K. *Systematic Moral Education.* Barnes Co., N. Y., 1910, 225 pp.
Compayré, J. G. *L'éducation, intellectuelle et morale.* Delaplaine, Paris, 1908, 456 pp.
Cronson, Bernard. *Pupil Self Government.* Macmillan, 1907, 100 pp.
Darrah, Estelle M. Children's Attitude towards Law. *Barnes's Studies in Ed.*, 213-216, 254-258.
Dawson, G. E. Psychic Rudiments and Morality. *Am. Jour. Psy.*, Vol. XI, 181-224. (Good presentation of theory that immorality is retrogression.)
Delany, S. P. Morality and Public Schools. *Ed.*, 1907, 97-112.
Dewey, J. Chaos in Moral Training. *Pop. Sc. Mo.*, Vol. XLV, 433-443.
Moral Principles in Education. Houghton, Mifflin, 1909, 60 pp.
Downing, Bertha C. Moral Training in Our Schools. *School Hygiene*, May 1913, 91-103.

Du Bois, Patterson. *Natural Way in Moral Training.* Revell, 1903, 328 pp.

Elliott, J. L. Moral Instruction . . . in Ethical Culture School. *N. Y. Ethical Addresses*, Vol. XVIII, 1910, 113-138; 139-162.

Ethelmer, E. Fear as an Ethic Force. *West. Rev.*, 1899, Vol. VI, 300-309.

Fairchild, Milton. Visual Instruction in Morals. *Jour. of Ed.*, 1911, 65-66.

Faunce, W. H. P. Moral Education in Public Schools. *Ed. Rev.*, 1903, I, 325-340.

Flanigan, M. When Children Deem Spanking Just. *Jour. of Ed.*, 1903.

Frear, Caroline. Class Punishment. *Barnes's Studies in Ed.*, 332-337.

George, W. R. *The Junior Republic.* Appleton, 1910, 320 pp.

Gill System of Moral and Civic Training. N. Y. Pub. League, 1901, 152 pp.

Gould, F. J. Children's Ethical Classes. *Int. Jour. Ethics*, 1901, 214-226.

Griffiths, F. P. Student Self-Government in University of California. *Int. Jour. Ethics*, Apr. 1907, 347-360.

Griggs, E. H. Moral Education. Huebsch, 1904, 352 pp. Bibliog.

Gunckel, John E. *Boyville.* Toledo Newsboys' Assn., Toledo, 1905, 219 pp.

Hall, G. Stanley. Chapter on Moral Training in *Educational Problems*, ed. of *The Moral Life.* Vol. X of the Foundation Library for Young People. Ed. Soc., Chicago, 1911.

Children's Lies. *Ped. Sem.*, 1891, 211-218.

Moral and Religious Training of Children. *Ped. Sem.*, 1891.

Harrison, Elizabeth. *Child Nature*, Chapter VI. Kgn. Pub. Co., Chicago. $1.00.

Henry, A. Special Moral Training of Girls. *Int. Jour. Ethics*, 1903, 1-15.

Hewitt, Emma C. *How to Train Children.* Paul, Lond., 1910, 192 pp.

Honor System. *Ed.*, Jan. 1913. (Series of articles.)

Int. Moral Education Congress. Papers, Lond., 1908, Nutt.

Johnson, F. W. High School Boys' Morals. *Sch. Rev.*, No. 20, 1912, 81-94.

Jordan, D. S. Nature Study and Moral Culture. *Science*, N. S., 1896, Vol. IV, 149-156.

Kline, L. W. Study in Juvenile Ethics. *Ped. Sem.*, June 1903, 239-266.

Knowlton, T. S. *Education of the Will.* Lippincott, 1909, 210 pp.

Lindsey, Ben B. Childhood and Morality. *Kgn. Rev.*, 1909, 129-142.

Juvenile Courts. *Nat. Con. Char. Corr.*, 1905, 150-167; 479-487.

Luckey, G. W. A. Development of Moral Character. *Proc. N. E. A.*, 1899, 126-136.

Mackenzie, J. S. Moral Education. *Int. Jour. Ethics*, 1908, 273-291; 1909, 399-418.

Malleson, Mrs. Frank. *Early Training of Children.* Heath, 1893, 127 pp.

Mangasarian, M. M. Punishment of Children. *Int. Jour. Ethics*, Vol. IV, 493-498.

Meyer, Geo. E. Moral Training in Schools. *Ped. Sem.*, 1906, 409-60.

Moral Training in Public Schools. California Prize Essays. Ginn, 1907, 203 pp.

Morro, A. Moral Influence of Puberal Development. *Am. Jour. Soc.*, September 1899.

Noyes, Wm. Ethical Values of Manual and Domestic Arts. *Man. Train. Mag.*, 1910, 201-213.

Oliphant, James. Moral Instruction. *Int. Jour. Ethics*, 1906, 401-418.

Oppenheim, N. Why Children Lie. *Pop. Sc. Mo.*, Vol. XLVII, 1895, 372-387.

Osborn, F. W. Ethical Contents of Children's Minds. *Ed. Rev.*, Vol. VIII, 143-146.

O'Shea, M. V. Development of Ethical Sentiment in the Child. *Int. Jour. Ethics*, 1905, 68-76.

Palmer, G. H. *Nature of Goodness.* Houghton, Mifflin, 1903, 247 pp.

Ethical and Moral Instruction in Schools. Houghton, Mifflin, 1909, 55 pp.

Can Moral Conduct be Taught in Schools? *Forum*, Vol. XIV, 673-685.

Patterson, Alma. Children's Motives. *Barnes's Studies in Ed.*, 352-355. U. of Chicago Press, Chicago.

Payot, J. *Education of the Will.* Funk and Wagnall, 1909, 424 pp.

Pott, W. S. Honor System in the University of Virginia. *Ed.*, Jan. 1913, 303-311.

Putnam, Alice H. Moral Controls in Nursery and Kindergarten. *Ele. Sch. Teach.*, 1909, 493-503.

Quiller, H. H. Can Children be Taught Morality? *Jour. of Ed.*, 1901, Vol. XXIII, 488-491.
Rashdall, Hastings. Theory of Punishment. *Int. Jour. Ethics*, Vol. XI, 20-31.
Richman, Julia. The Incorrigible Child. *Ed. Rev.*, 1906, 484-506.
Rogers, J. F. Physical and Moral Training. *Ped. Sem.*, Sept. 1909, Vol. XVI, 301-304.
Rowe, S. H. Fear in the Discipline of the Child. *Outlook*, Sept. 24, 1898, 234-235.
Royce, Josiah. Physical Training . . . Moral Education. *Bost. Nor. Sch. Gym.*, 1908, 32 pp.
Rugh, Chas. E. Books for Moral Training in Schools. *Rel. Ed.*, 1908, 137-146.
Sadler, S. H. *Higher Education of the Young.* Lond., 1907, 276 pp.
(Ed.) *Moral Instruction and Training in Schools.* Longmans, 1908, 2 vols. (Summary of conditions all over the world.)
St. John, E. P. *Stories . . . in Moral and Religious Education.* Pilgrim Press, Boston, 1910, 100 pp.
Veracity. *Ped. Sem.*, 1908, 246-270.
Savage, M. J. Rights of Children. *Arena*, Vol. VI, 8-16.
Schallenberger, M. Children's Rights as Seen by Themselves. *Ped. Sem.*, 1894-6, Vol. III, 87-96.
Schroeder, H. H. *Psychology of Conduct.* Row, Peterson & Co., Chicago, 1911, 287 pp.
Sears, C. H. Home and School Punishments. *Ped. Sem.*, 1899, 159-187.
Sharp, F. C. Aims of Moral Education. *Int. Jour. Ethics*, 1899, Vol. IX, 214-228.
Sharp and Newman. Moral Education for High Schools. *Rel. Ed.*, Feb. 1913, 653-680.
Sheldon, Winthrop D. Programme of Ethical Teaching in our Schools. *Ed.*, 1907, 262-270; 353-370. Bibliog.
Sisson, E. O. Can Virtue be Taught? *Ed. Rev.*, 1911, 261-279.
Sisson, Genevra. Who Has the Best Right? *Barnes's Studies in Ed.*, 259-263. U. of Chicago Press, Chicago.
Smith, Theodate L. Obstinacy and Obedience. *Ped. Sem.*, 1905, 27-54.
Spiller, Gustav. *Moral Instruction . . . in Schools of Austria, Belgium, etc.* Lond., 1909, 362 pp.
Stearns, A. E. Moral Standards in Schools. *Ed.*, No. 32, 1912, 529-538.
Stewart, A. H. *American Bad Boys in the Making.* N. Y., 1912, 241 pp.

Street, I. R. Study in Moral Education. *Ped. Sem.*, Vol. IV, 5-40.
Tanner, Amy E. Children's Ideas of Honor. *Ped. Sem.*, Dec. 1906, 509-511.
College Woman's Code of Honor. *Ped. Sem.*, Mar. 1906, 104-117.
Elevation of the College Woman's Ideal. *Int. Jour. Ethics*, Apr. 1907, 361-370.
Taylor, C. K. *Moral Education of School Children.* Printed for the author. Phila., 1913, 77 pp. $0.75.
Thompson, H. M. Moral Instruction in Schools. *Int. Jour. Ethics*, 1904, Vol. XIV, 400-418; Vol. XV, 28-47.
Thurston, Henry W. Social Significance of Juvenile Court. *Sch. Rev.*, 1906, 415-424.
Trask, Mary G. What is a Good Child? *Kgn. Rev.*, 1901, Vol. XII, 1-6, 126-32.
Travis, Thomas. *The Young Malefactor.* Crowell, 1908, 243 pp.
Triplett, Norman. Faults of Children. *Ped. Sem.*, 1903, Vol. X, 200-238.
Ueda, Tadaichi. Psychology of Justice. *Ped. Sem.*, Sept. 1912, 297-349. Bibliog.
Urwick, H. M. "If You Found a Shilling?" *Paid.*, 1901, Vol. III, 18-22.
Van Liew, C. C. Mental and Moral Development of the Kindergarten Child. *Proc. N. E. A.*, 1899, 551-559.
Vaughn, S. J. Moral Significance of Vocational Motive. *Ed.*, June 1913, 591-603.
Vincent, Geo. E. Group Morality of Children. *Kgn. Mag.*, Vol. XV, 1903, 559-565.
Votaw, Clyde W. Curriculum for Moral and Religious Education of Boys and Young Men. *Assn. Sem.*, 1908, 203-220.
Welton, J., and Blandford, F. G. *Moral Training.* Clive, Lond., 1909, 262 pp.
Wiggin, Kate D. Rights of Children. *Scribner's Mag.*, Vol. XII, 242. *Also* in book form as *Children's Rights.* Houghton, Mifflin, Boston. $1.00.
Wilson, Albert. *Education, Personality and Crime.* Greening, Lond., 1908, 296 pp.
Winterburn, Florence Hall. *Nursery Ethics.* Baker, N. Y. $1.00.
Wyckoff, Adelaide E. Children's Ideals. *Ped. Sem.*, 1901, Vol. VIII, 482-494.

The *Journal* and *Proceedings* of the Religious Education Association have numerous articles on moral training.

CHAPTER XIII

Feelings and Emotions

1. Trace in some one child the growth of fear, anger, and love. Note what called out the *first* expression in each case, and how the range of objects widens. Did the child express affection before he was taught the kiss or the loving pat? Was he imitating? **Observations**

2. Ask children of what they are most afraid, and why.

3. Obtain from adults reminiscences of the persons whom, as children, they loved best.

(1) At what age did the love exist?

(2) What relation did the person hold to you? How well did you know the person? Did you see the person daily or hourly? Was mystery an element in the love?

(3) Why did you love the person? On account of substantial services, like feeding and clothing you? Or for some personal quality? Or because of kisses and caresses for you? Or for gifts—candy, picture books, etc.? (It would hardly be possible to question children themselves, as the knowledge that their papers were to be read by the teacher would prevent a free expression of feeling.)

The fundamental springs of action are pleasure and pain, and in all probability they exist even in forms of life that have no nervous system. Mere sensory pleasures

and pains in their simplest forms involve no memory but very soon they become complicated by past experiences and we find the beginning of fear and hope. Thence up the scale, both intellectual and emotional associations build up the many forms of emotion for which language is so inadequate.

The feeling aspect of consciousness has been relatively little studied save by G. Stanley Hall and his pupils, and for the most part our account must therefore follow their work with occasional references to morbid phenomena.

First pains and pleasures

Even before birth it is probable that a child feels pains and pleasures of touch, from pressures and jars, but these are necessarily vague. After birth, for a long time, the most vivid feelings are those connected with hunger and its satisfaction, with warmth and cold, and with touch. Under this last head come the baby's delight in being relieved from the confinement of clothing, the comfortable feeling of water in the bath, and the pleasure of being rubbed dry and warm. Preyer and Compayré agree that in the first months of life the greatest pleasure is the negative one of getting rid of pain. In the course of a month, moderately bright lights and slowly moving objects cause pleasure, and by the second month bright colors and sweet sounds are sources of delight. Between the fourth and sixth months, the pleasure of grasping things and the delight of being able to do things, such as tearing or crumpling paper, ringing the bell, and so on, come into prominence.

The appearance of the first smile that indicates pleasure is the occasion of much rejoicing. Of course, a baby may make grimaces that look like smiles very early, either accidentally or as the reflex of some one else's expression, but the first smile of delight, Darwin says, did

not appear in his son until the forty-fifth day. The smile is usually accompanied, especially as the child gets a little older, by crowing and kicking, and movements of the arms. Perez says that the little baby is easily fatigued by any unusual experience, whether pleasurable or painful, and should not be constantly amused by over-fond mothers.

If he is well, the baby is usually content to lie in his cradle and take in from it the sights and sounds about him, dropping off to sleep at intervals to recover from the pressure of the novel world. He gets all the amusement that his nervous system can stand in this way.

In the history of the race, however, there is much to indicate that pain in one form or another has been more prominent than pleasure, and fear more potent than hope. Pain calls out stronger reactions than pleasure, and imprints itself more upon the organism. It is easier to create fear than faith, and the attitude of curiosity is more readily tipped toward distrust than toward confidence. Again, anything that lowers the vitality increases the tendency to fears, and so we find physicians asserting that a universal characteristic of nervous diseases, if not of all disease, is the presence of fear or anxiety.

Fears

The normal fears of children have been studied in more detail than any other emotion, and the various observers agree in their general outline of the frequency and uncaused nature of certain fears. It is generally agreed that certain types of stimuli call out instinctively the fear reaction and that these are the stimuli that have been phylogenetically dangerous, while the reactions have, on the whole, been of service.

The very first fears, which come at least as early as the third month, are due almost entirely to surprise. Loud or unexpected sounds, therefore, such as thunder, or the banging of a door, or the furious barking of a dog,

are the most common causes of these fears. A little later, strange objects and persons call out protests and tears from many children, but the fear is only slight. The recovery from it may be followed by laughter and delight. This makes it possible to train a child to face little fears, and afterward larger ones, bravely.

In Sully's record the first fears of things seen were called out by a strange place in the fourth month, and by a strange face in the sixth month. This latter fear was not overcome for a year. New clothes may cause terror, and tossing in the arms and learning to walk alone also cause many fears. In both these cases, the feeling of insecurity is doubtless the potent factor. Dolls that have anything unusual about them, such as oddness, or ugliness, or broken members, also arouse fear. In this class also should be put fears of apparently uncaused occurrences, such as a feather floating in the air, or the shadow of a cloud moving over the grass. Some observers of animals claim that this is what makes horses shy at a bit of paper in the road. The story of the dog who was frightened into a fit by seeing a bone moved by an invisible thread also belongs here. Fear of the dark does not occur until the fourth month or later, as a rule, and is closely connected with imagination.

All these fears may rise at any time with children who never had them before, and they may persist through life, or remain for only a short time. Fear of black things, black animals, black dresses, black places, and fears of furs and of teeth, occur also with some children without any experience to justify them. Whether they are reverberations of ancestral or prenatal experience or not, we cannot say. Preyer records that at ten months his boy was afraid of high tones; and at twenty-one months, of the sun. Doubtless each parent can cite other individual instances.

Let us consider now the proportions of children who have and who have not fears, and the numbers and the causes of the fears. It seems to be the case that deaf children fear more kinds of things than normal children, and have more imaginary fears. The sense of helplessness is more prominent. Imbeciles, on the other hand, have fewer fears, for they do not know enough to be afraid. Miss Calkins has investigated the fears of children with these results:

Percentage of fears

ALL CHILDREN

	Under 3 Years	3 to 6 Years	6 to 16 Years
No fear	39%	11.5%	5 %
Fear	61	88.5	88.2

COMPARISON OF BOYS AND GIRLS

	Under 6 Years		6 to 16 Years	
	Boys	Girls	Boys	Girls
No fear	17.4%	24.2%	1.7%	0%
Fear	82.6	75.8	98.3	100

The girls show less variety in their fears and are less afraid of imaginary things than the boys. Under three years, 66 per cent of the fears were of things seen, and 23 per cent of things heard, an exact reversal of the fears of the baby. Both of these diminish somewhat by the sixth year, and the number of miscellaneous fears increases. The change in the objects of fear at different ages is also very interesting:

	Things	People	Ghosts	Dark	Wild Animal	Dom. Animal	Nature
Under 6 years	7.3%	17.2%	2.5%	9.8%	14.7%	26.2%	93%
9 to 14 years	2.2	2.4	2.2	1.3	60.6	13.7	4

Imaginary fears increase from 27 per cent at the age of six to 55 per cent at fourteen. Indeed, we may probably class the enormous increase in the fear of wild animals as an imaginary fear to a large extent, for few children have any actual experience with wild animals. The fear of domestic animals decreases. All fears of the other things with which the child deals constantly, decrease steadily, except fear of nature. Here the feeling of helplessness and uncertainty seems to increase with experience. A comparison of these observations with the reminiscences collected by Dr. Hall which are far more numerous than any others, and by Holbrook, will be of interest.[1]

OBJECTS OF FEAR UNDER 23 YEARS OF AGE

	HALL		CALKINS	HOLBROOK
	GIRLS	BOYS		
Thunder	14%	9%	.....	1%
Lightning	.....	.....	.....	.....
Persons	11	9	7.6%	18
Reptiles	11	9	.....	.....
Darkness	0	9	4.4	22
Death	6	4	.....	6
Domestic animals	6	3	18.4	12
Wild animals	.....	.....	43.4	.....
Rats and mice	4	$\frac{1}{8}$	.....	.....
Insects	4	3	.....	.....
Ghosts	4	$2\frac{1}{2}$	2.2	$\frac{7}{10}$
Wind	$3\frac{1}{2}$	2	.....	.....
End of world	3	$\frac{3}{8}$	.....	.....
Water	3	$3\frac{1}{2}$	.....	.....
Robbers	$2\frac{3}{4}$	2	.....	.....
Miscellaneous	$2\frac{3}{4}$	2	.....	3
Monsters	.....	.....	.....	1
Hill	.....	.....	.....	3
Vague fears	.....	.....	.....	4

Dr. Hall gives an average of 2.21 per cent fears for each boy, and 3.55 for each girl, while from other figures he

[1] Varendonck's recent study agrees with Hall's as to objects most feared.

gets an average of 2.58 for each boy, and 5.46 for each girl.

For different ages the averages are:

	Under 4	4 to 7	7 to 11	11 to 15	15 to 18	18 to 26
Boys.....	1.76%	1.5 %	3.56%	3.69%	3.60%	2.55%
Girls.....	4.89	2.44	4.34	6.22	10.67	4.31

This directly contradicts Miss Calkins's observations for children under the age of six, as she found that girls have fewer fears than boys.

Bashfulness

Bashfulness is an offshoot of fear, the survival in a lessened form of what was active terror in our ancestors. It appears in the little child as an instinctive shrinking from strange persons and things. It is not marked enough to be called fear. However, it may be overcome under proper conditions by imitation, but is succeeded in the second or third year by a second shyness, which is due to self-consciousness. The three-year-old hides and yet looks; he wants to become acquainted, but cannot forget himself enough to do so. Such bashfulness is likely to obtrude itself under unusual circumstances until adolescence is passed.

The unlearned character of many of these fears is most significant, and points to their being truly instinctive. Many of them serve no useful purpose now and are even positive detriments. Sometimes they develop without any discoverable cause, like fear of the darkness, and are so intense that the most parents can do is to avoid, as far as possible, the occasion of them.

In both children and adults they shade over into morbid fears, and into the group of states characterized in recent medical literature as anxiety neuroses. Morbid fears or phobias are uncontrollable, and cause extreme fears of objects or situations in themselves harmless or

harmful to a very slight degree. Familiar cases of these are the uncontrollable fear of cats that some persons have; the fear of crossing an open space or staying in a closed room; the fear of pronouncing a certain word; the fear of a bunch of grapes, *ad infinitum*. In such cases the unfortunate victim usually recognizes the foolishness of the fear, but is unable to control it, and is of sound mind in all other directions. The phobia lessens as general health improves, and often gives way to another. In some instances it may be fought and conquered, but in others it persists intermittently, varying with the general state of health and worry of the patient.

The anxiety neuroses are also very common states, in which the patient shows all the physical signs of fear but has no definite thing in his mind of which he is afraid. Here too the fundamental thing seems to be the state of the nervous system. We may almost say that the strong, vigorous person cannot worry. Under the greatest misfortunes and sorrow his buoyant nature reasserts the fundamental goodness and joy of life. The neurasthenic, on the other hand, finds it equally impossible not to fear even when every circumstance points to success and happiness.

Another morbid aspect of fears is seen in the night terrors of children. These may rise from various causes, some of them serious, and a physician should be consulted if a child is subject to them.

As fear is so universal a factor, the proper treatment of spontaneous fears and the pedagogic value of fear as a motive are important topics. One of the most important things in the education of the little child is to teach him what objects are dangerous in the world about him. If he is to be self-reliant and efficient he must be able to deal with them in one way or another without serious

harm, and probably there is no way so effective as allowing the child to get slight hurts in order to make him cautious on his own account. Only the hurt child dreads the fire, knife, stairs, and other things, and the unhurt child must forever be rash and a great burden to those who so carefully protect him. The time for teaching these fears by slight hurts surely is while the child is still at home under the mother's protection.

The instinctive fears of objects no longer dangerous are harder to deal with. As we have already seen, fear is fought indirectly by keeping the child in vigorous health. Aside from this an attitude of courage and calm on the part of parents is the best aid until the child is old enough to understand the harmless nature of the object in question. It is not always, and perhaps not usually, wise to leave a child at the mercy of his fear of the dark, or of whatever fear possesses him, for it may be so great that permanent nervous injury is done him. It is always well to encourage a child to overcome such fears, but if he is not old enough or strong enough to do so, he should certainly not be left the victim of unreasoning terror.

As the child becomes older and the objects of fear become more numerous with the development of imagination and reason, and his desire for social approval, fear becomes one of the most potent of educational forces. Fear of physical pain we have already seen to be of value in some cases, but fear in its milder forms—such as fear of losing some privilege, fear of being disliked, despised, and so on—is of far greater service. Many of life's choices lie between what the selfish self desires and the social self denies, and in making the choice the factor of fear in these milder forms is surely as powerful as that of hope. To learn to fear aright, we may say in summary, is one of the great lessons of life.

Anger and fear are commonly considered instinctive emotions, that is, certain objects, upon the first acquaintance with them, will call out the same feelings and expressions from all men. Darwin observed that as early as the eighth day his child wrinkled his forehead and frowned before crying, as if angry; and in the second month Perez observed that the child showed anger by pushing away with a frown objects that he did not like. In the fourth month anger is certainly shown; the face and head become red, and the cry shows irritation. This is caused at first by delay in supplying food; but two or three months later it will be called out by any thwarting of desire, such as the dropping of a toy.

Anger

Anger at this early age, it must be noted, is simply the instinctive rebelling against pain. It is wholly unreasonable, and is best dealt with by diverting the child's attention if the deprivation is for the child's good. As a child gets a little older, especially if he is a boy, he is likely to vent his anger by beating the person or thing that offends him, or by throwing things at them. Here, also, until a child can be reasoned with, diversion of attention and the final securing of an expression of affection is the wisest method of treatment.

At best, only a few of the causes of anger can be enumerated. There is, in the first place, what may be called an irascible disposition, with which some seem to be born. Disappointments and vexations which others would hardly notice result in violent outbursts of temper. Personal peculiarities of speech, gait, dress—almost anything, in fact—may lead to a hatred that is almost murderous in its vindictiveness. When a child is so unfortunate in disposition, only the most constant, temperate, and kindly training in self-control will help him.

Causes of anger

There are, in some cases, physical conditions causing constant irritation which are reflected in this bad temper. Hence, parents should first of all ascertain whether the child is healthy. Fatigue is also a common cause of irritability. With older children as with younger, the thwarting of expectations is one of the most common causes of anger. A child to whom a promise has been broken, who has been "fooled," who has been called home before he finishes his game, is usually an angry child. Anger over a violation of justice or principle is relatively uncommon in children. The feeling of pain or the suffering of personal injury is usually the underlying cause.

Control of anger

As to the method to be used in controlling anger, we find the most conflicting theories. The natural tendency is to express the anger in some way—to strike or bite or scratch, or at least to say sharp words or to slam a door. Many men find great relief in swearing, and others think vigorously what they dare not say. In all these cases there is some vent for the emotion, and usually it is some kind of reaction against the person who caused the anger. Dr. Colin Scott has collected cases of girls who, when angry, would picture themselves as dead, and the person who had injured them as suffering from remorse. He advocates this as a healthy outlet for an emotion which, if kept in and allowed no expression, causes more and more resentful brooding over the wrong.

It is true that nothing can be worse than to brood over an injury, but expression of the anger is not the only alternative for this. Anything that keeps the mind off the injury and uses up the energy is equally serviceable. A long walk, chopping wood, carpentry work, embroidery—anything that is not so habitual as to be

automatic, anything that forces one to attend to it, may be the vent for anger. Then after a time the first strength of the emotion passes away, and we can combat it by reason and by the cultivation of love or pity in its place.

It is doubtful if anything but harm comes from allowing ourselves to express any bad emotion. The very expression reënforces the feeling and makes it more lasting. We can do naught but condemn the attitude which is cultivated by picturing one's self as the injured party, the cause of remorse to others. One may or may not have been injured when one has been angered, but whether or not this is the case, the pose of self-righteousness, of the injured martyr, is the pose of a prig and has nothing admirable in it. In short, to repress the expression of anger, and to cultivate the expression of love, is in large part to repress the anger and increase the love, and is the best training in self-control.

Jealousy

Jealousy, Gesell tells us, is both one of the most primitive and one of the most painful emotions. It seems to be present even among invertebrate animals, and from them up to man it plays an important part in shaping the development of the species. Among animals it appears in connection with feeding, mating, and breeding, and serves as a corrective to too great sociability or sympathy, with the connected danger of injury to the individual.

Among children it appears during the first year, especially with regard to feeding and holding, and it may become very acute in children of a year and a half or two years of age. The child is not only jealous of other children, but of any one who takes the attention of the mother or nurse from himself.

School children have a wider range of jealousies, and they are the motivation of much apparent cruelty, bullying,

and teasing. The school system of rewards offers plenty of occasion for jealousy, but clothing, school lunches, toys, and other things do as well. The adolescent is still more subject to this passion, and while it may take on the sexual form it is by no means limited to this.

Among little children jealousy is shown in such ways as stamping, screaming, fighting, or kicking, while with children from six to twelve it is more likely to appear in sulking, slandering, or threatening. The same is true of youth. At all ages the jealous child is likely to attempt to even the scales in any convenient way, playing a trick on the envied person, snubbing him, making faces at him. "If we cannot exalt ourselves we humiliate others, and make ourselves worthy by making them feel cheap; the net result is the same: a more non-irritating level."

Whether jealousy has any value, and if so how it should be treated, are difficult problems on account of the great intensity and complexity of the feeling. Sutherland believes that family life will never be kept up to its highest level without a certain amount of sexual jealousy, which both develops and preserves conjugal fidelity and monogamy. On the other hand, the danger in the instinct appears in all sorts of examples in which the sex factor does not appear. Many distinguished men find it psychologically impossible for them to praise or to assist another distinguished man in their own line of work. The backbiting among those in any given profession is notorious, and is by no means limited to persons who have themselves injured or slighted the backbiter. The young doctor or lawyer just beginning practice must fight not only indifference on the part of possible patients but hostility from those in his own line. Any slight preëminence, by that fact alone, brings a certain amount of jealousy of the capable person, with the allied unfriendly actions.

Again, the effect of jealousy both upon the subject and the object seems to be bad in many cases. Out of one hundred and twenty testimonies given to Gesell, seventy-six say they feel humiliated and shamed by an attack of jealousy, and only a few testify to the good resulting from their attempt to overcome the passion. Out of two hundred and four persons testifying as to their attitude toward a person jealous of them, seventy-nine felt kindness or pity, but only twenty-three did anything to allay the jealousy. The others, in about equal proportions, shunned the person, felt dislike or contempt, pride or triumph. Thirty-two tried to aggravate and torment the jealous person.

Altogether, even though we admit that jealousy, to some degree, is almost inevitable in the life of every person, it seems probable that it is naturally so intense that little but harm can come from rousing it in its more primitive forms, and that even in the higher forms of rivalry and emulation great caution must be used. If the child's and youth's mind can be fixed on raising himself to the desired level, the worst effect will be escaped, though even here he may feel unworthy pangs when a rival succeeds; but if his energies are directed to keeping others below himself, there is no limit to the depths to which he may sink.

Gesell's suggestions as to the treatment of jealousy in children are admirable. Jealousy is a sign of a wounded self, and is most effectively cured by comforting, reassuring, and restoring this self. In little children repeated reassurances of the parents' love, of their equal love for all their children, are the best preventive and cure. With older children, added to this should be considerations of ways in which the child may respect or congratulate himself on what he is or has. The development of a normal pride and self-respect for worthy qualities is the

best preventive of morbid jealousy; and, conversely, the parents who teach excessive humility and self-depreciation are also preparing a fertile ground for jealousy and all her ugly brood of sneaking meannesses.

In Ordahl's opinion, the higher emotions of rivalry and emulation may be safely used if they are restricted to the field of action, but not in the field of revelation and insight.

Prominent among the pleasures that seem to have no object, is the child's delight in being tickled. A summary of Dr. G. Stanley Hall's investigation of this subject follows. Most children and even adults have a tendency to fuss with the skin, to rub it or scratch it, especially if it has any slight bruise, roughness, or eruption that causes a feeling of uneasiness. There seems to be a demand on the part of the skin, as of the other sense organs, to be stimulated. This need is satisfied by rubbing, and also, especially, by tickling. The sensitiveness of the parts of the body varies more or less, but this is the general order: soles, under arms, neck, under chin, waist, ribs, and cheeks. Many children can be thrown almost into fits by a little tickling, and at some we need only point the finger to send them into gales of laughter. Dr. Hall considers this great sensitiveness a survival of ancestral experiences in tropical lands, where the sense of touch must be very delicate to escape the bite of poisonous insects.

Tickling and laughing

Another source of merriment to children is found in the animal world. Children, says Dr. Hall, have a closer connection with animals than do adults, because the organs common to men and animals, which in the adult are atrophied, are relatively larger in the child. There are over one hundred and forty of such organs, and they furnish a larger background of common feeling than is possible with the adult. The animals which are most

often the cause of merriment are, in the order of frequency, the dog, cat, pig, monkey, rooster, crow, chicken, duck, ape, goose, sheep, cow, and horse. Children are also prone to laugh at what is forbidden or secret. This is due to a relief of tension, Dr. Hall thinks, and is injurious on every account. It lessens the restraint upon social decency, and gives rise to wrong feelings about sexual subjects. It furnishes still another argument in favor of giving a child knowledge of such matters.

A crude sense of humor seems to rise at an early age, showing itself in the love of practical jokes as well as in puns and alliterations and conundrums and word riddles. Kline and Colvin have pointed out the value of training the sense of humor. It keeps the mental structure pliant, and does much therefore to enable the individual to meet obstacles with equanimity.

Joys and sorrows

Out of nine hundred children 40 per cent remember a Christmas or a birthday as the happiest day of their lives; and 25 per cent remember an excursion or a picnic on account of the fun that they had. Anything of a pleasing nature which introduces novelty into a child's life delights him.

The death of some relative or friend caused the unhappiest day for 50 per cent of the children, while sickness, physical punishment, or disappointment caused it for 35 per cent. In general, the greatest joys and sorrows of a child at any time or age are connected with the satisfaction or thwarting of his strongest interest.

Sympathy and pity

The first expression of sympathy is purely imitative. The baby of six months draws down his mouth when others cry, and laughs in response to laughter. If James's theory of the emotions be true, this instinctive reaction creates a corresponding state of mind, at least to a slight degree, which is the basis of

sympathy. As a child grows older, he learns more and more by experience what states of feeling certain expressions stand for, and is able to put himself into the other person's place. Preyer records that in the twenty-seventh month his son cried with pity at seeing paper dolls cut in two. This first pity is, as we should expect, shown in connection with physical things—hunger and cold, lack of shelter and clothing. On the other hand, children frequently laugh at deformity and sorrow. One of the sad chapters in the lives of feeble-minded children is that they can seldom be allowed to play with normal children because they are badly treated. Such ill treatment is not, however, so much a sign of cruelty in children as of ignorance, and can usually be cured by showing the child the real suffering that he is causing.

In the same way he can be taught kindness to animals. It is certainly true that very often when children are hurting animals cruelly and are laughing at their contortions of pain, they do not see anything more than the mere movements, as of a jumping-jack. Their fondness for practical jokes shows this same characteristic. The only cure for such lack of sympathy is a wide experience and a constant exercise of the imagination in "putting yourself in his place." When Marie Antoinette was told that the starving peasants of France had no bread to eat she asked in all simplicity, "Then why do they not eat cake?" She lacked the experience necessary for sympathy.

Love

It is commonly said that the child's first affection is given to his mother and is based upon his physical dependence on her and his pleasure in the warmth and comfort he obtains from her. It is difficult, however, to see how anything but the feeling of dependence and of personal enjoyment can rise from

this basis. Rather, we take the ground with Dewey, that sympathy which seeks an outlet in action is love, and that antipathy which seeks an outlet in action is hate. When our liking for a person depends solely upon his usefulness to us, it is unworthy of the name of love.

To return to the baby, his first spontaneous caresses are, naturally enough, given to the one who tends him and whom he knows best—his mother. As he grows older, the love of parents and of friends can show itself more and more in different ways, and his first responses, which were to a large extent instinctive and vague, also become more varied. His love for his parents deepens and widens to include friends and God.

Mothers sometimes lament the growth of their children to manhood and womanhood, as if the bonds of love were lessened thereby. This may happen where a child is allowed to accept without any *return* the greatest sacrifices from his parents. He is thereby taught selfishness and allowed to think that his good is distinct from his parents' and superior to it. It is sometimes said that the most selfish person is the one most tenderly loved. There is a certain truth in this.

Selfishness in affection

Love is, in its very nature, active and self-sacrificing, and increases in proportion to what it does. If it is expended upon a selfish person who is believed to be worthy of it, or if it is called out toward a sick or helpless person, it finds ample room for growth. So when a child is little, the parents' love is peculiarly tender, and it is hard to have this love grow into a different, though equally strong one, and still harder to train the child to love by teaching him sympathy and service.

Love and service are, however, inseparable terms, and so, even from babyhood, the little one should be allowed and encouraged to do his best in helping about the house,

in comforting his parents in their worries, and in celebrating their joys.

In every possible case some act expressive of his love should be suggested, and with it, the loving word and the caress. Anglo-Saxons are proverbially reserved; in our fear of hypocrisy, we go to the other extreme of reticence. Many a child can remember each individual kiss that he has received from parents who would give their lives for him if necessary, and who do sacrifice many pleasures and luxuries. Such restraint works a harm to the child in allowing him to believe himself unloved in contrast to his more fortunate companions who are kissed and caressed. He is not of an age to understand the love that gives up comforts to provide him an education, while leaving him without the loving word and the kiss for which he longs. Parents do themselves wrong in their children's eyes, and hurt the children, by such methods. Is it not better to have both the act and the word or caress? We understand that words without deeds are vain, but why should we not have words with deeds?

Caresses

Finally, there is no better way to cast out hate, jealousy, and all their brood than by service; loving service if possible, but any sort of service at first to which we can persuade the child. A forced kindness later becomes spontaneous if persisted in. While it may only breed hypocrisy in a child to compel him to treat kindly a child whom he dislikes, yet we can very often call his attention to some interesting or lovable or pitiable trait so that he will of his own accord help the child and grow to like him.

Love and service

Richter tells us to teach our children to love, and they will need no ten commandments, and we have a higher authority than his for the belief that the Law and

the prophets are summed up in the commandments to love God, and to love our neighbor.

REFERENCES

Baldwin, J. Mark. Bashfulness in Children. *Ed. Rev.*, Vol. VIII, 434-441. (Same as in *Mental Development.*)

Mental Development: Methods and Processes. See Index. Macmillan, N. Y. $1.75.

Bell, Sanford. Emotion of Love between the Sexes. *Am. Jour. Psy.*, July 1902.

Bergson, Henri. *Laughter.* Macmillan, 1911, 200 pp.

Borgquist, Alvin. Crying. *Am. Jour. Psy.*, 1906, 149-205.

Bowles, Mary E. Emotions of Deaf Children Compared with Emotions of Hearing Children. *Ped. Sem.*, Oct. 1895, 331-334.

Boyd, A. K. H. Concerning the Sorrows of Childhood. *Atlantic Mo.*, Vol. IX.

Brill, A. A. The Anxiety Neuroses. *Jour. Abn. Psy.*, Vol. V, 1910, 57-68. Brief Bibliog.

Calvin, S. S. Educational Value of Humor. *Ped. Sem.*, 1907, 517-524.

Campbell, Harry. Morbid Shyness. *Brit. Med. Jour.*, Sept. 1896, 805-807.

Cannon, W. G. Physiological Changes Accompanying Fear and Rage. *Psy. Bull.*, Feb. 15, 1912.

Carpenter, E. Affection in Education. *Int. Jour. Ethics*, 1899, Vol. IX, 482-494.

Compayré, G. *Intellectual and Moral Development of the Child*, 165-208. First Emotions. Appleton, N. Y. $1.50.

Darwin, C. Biography of a Child. *Mind*, 1877.

Dugas, L. *La timidité.* Baillière, Paris, 1898, 167 pp.

Falkenthal, K. Emotional Life of Children. *Wellesley Coll. Psy. Studies. Ped. Sem.*, Vol. III, 319-330.

Féré, Ch. *Pathology of the Emotions.* University Press, London, 1899, 525 pp.

Ferrero, G. Cruelty and Pity in Woman. *Monist*, 1893, 220-234.

Gesell, Arnold. Jealousy. *Am. Jour. Psy.*, 1906, 437-495. Bibliog.

Groos, Karl. *The Play of Man*, 166-169, 232-237. Appleton, N. Y., 1901. $1.50.

Hall, G. S. *Adolescence.* *See* Index.

Education of the Heart. *Kgn. Mag.*, Vol. XI, May 1899, 592-595; 599-600; 604-607; *also* Redlands Rev. Press, Rept. S. Cal. Teach. Assn., Dec. 21-24, 1908, 31-38.

Anger. *Am. Jour. Psy.*, 1899, Vol. X, 516-591.

Fears. *Am. Jour. Psy.*, 1897, Vol. VIII, 147-249.

Hall, G. S., and Allin, A. Psychology of Tickling, Laughing and the Comic. *Am. Jour. Psy.*, Vol. IX, 2-40, 234-240.

Hall, G. S., and Saunders, F. H. Pity. *Am. Jour. Psy.*, Vol. XI, 534-591.

Hall, G. S., and Smith, T. L. Showing Off and Bashfulness. *Ped. Sem.*, Sept. 1903, 275-314.

Harrison, M. M. Child's Sense of Fear. *Arena*, 1896, 960-969.

Hartenberg, P. Psychology of Shyness. *Paid.*, Vol. II, 110.

Holbrook, A. S. Fear in Childhood. *Barnes's Studies in Educ.*, 18-21. U. of Chicago Press, Chicago.

Janet, Pierre. *Major Symptoms of Hysteria.* Macmillan, 1907, 345 pp.

Kline, L. W. Nature, Origin and Function of Humor. *Pop. Sc. Mo.*, 1908, 144-156.

Little, E. G. Night Terrors. *Brit. Med. Jour.*, Apr. 19, 1899.

McNaughton, Jones H. Fear and Evolution of Child. *Child*, 1910, 109-115.

Maitland, Louise. Children's Attitude towards Ghosts. (Fear.) *Barnes's Studies in Ed.*, 64-67, 176-177. U. of Chicago Press, Chicago.

Malapert, P. Le sentiment de la colère. *Bull. de la Soc. Libre*, Jan. 1903, 241. Also *Ann. Psy.*, 1902, 1-40.

Morse, Josiah. Psychology and Neurology of Fear. *Am. Jour. Rel. Psy.*, Monog., Sept.-Nov. 1907, 106 pp.

Mosso, A. *Fear*, Chapter XI. Longmans, N. Y. $1.75.

Oppenheim, Nathan. *Textbook of Nervous Diseases.* Section on Psychasthenic Conditions.

Ordahl, Geo. Rivalry. *Ped. Sem.*, 1908, 492-549. Bibliog.

Perez, B. *First Three Years of Childhood*, Chapter V. Bardeen, Syracuse. $1.50.

Preyer, W. *Senses and Will.* Appleton, N. Y., 140-176. $1.50.

Ribot, Th. *Psychology of Emotions.* *See* Index. Scribner's, N. Y. $1.25.

Siviter, Anna P. Fear of Childhood. *Kgn. Mag.*, October 1899, Vol. XII, 82-87.

Slack, H. W. Origin and Development of the Emotional Nature. *C. S. M.*, 1900, 96.

Stanley, Hiram. *Evolutionary Psychology of Feeling. See* Index. Macmillan, N. Y. $2.25.

Psychology of Pity. *Science*, Sept. 28, 1900.

Stevenson, A. Jealousy in Infants. *Science*, October 1892.

Stryker, Mabel F. Children's Joys and Sorrows. *C. S. M.*, Oct. 1898, 217-225.

Sully, James. *Studies of Childhood.* Subject of Fear. 190-227. Appleton, N. Y. $2.50.

An Essay on Laughter. Longmans, 1902, 441 pp.

Tuke, Hack. *Dictionary of Psy. Medicine*, article on Night Terrors.

Tyrrell, M. A. Fear in Home and Household. *Nineteenth Cent.*, 1908, 447-453.

Varendonck, J. Phobies d'enfants. *Rev. Psy.*, 1910, Vol. III, 5-45.

Vostrovsky, Clara. Children's Superstitions. *Barnes's Studies in Educ.*, 123-143. U. of Chicago Press, Chicago.

Whitney, H. M. Fear as a Religious Motive. *Bibliotheca Sacra*, Apr. 1906, 227-241.

Wilson, Geo. R. Sense of Danger and Fear of Death. *Monist*, Vol. XIII, 1902-3, 352-369.

CHAPTER XIV

Impulsive, Reflex, and Instinctive Movements

1. Keep a record of the development in some individual child of the movements described in this chapter. (1) Impulsive movements. Note especially the posture of the baby in sleep. When does a child begin to sleep lying straight? (2) Reflex movements. Note especially whether, in case of tickling or of brushing away an object, the baby uses the right hand or the hand on the same side of the body. That is, is he right-handed from birth, and if not, when does right-handedness appear? Note also the earliest inhibitions of movements. (3) Instinctive movements. Note especially to what degree the baby is impeded by long clothes. Watch for a climbing instinct. If possible, take instantaneous photographs of the nude baby's positions in learning these movements

Observations

2. Gather reminiscences from young people or adults of any one of the following instincts: migrating instinct (running away from home); hunting instinct; cave-digging instinct; tent-living instinct; collecting instinct. In all cases note:

(1) Age when the instinct developed.
(2) Length of time it lasted.
(3) Circumstances that called it out.
(4) Strength. How much could it withstand in the way of inducements to other sports, commands of parents against indulging in it, etc.?
(5) Is there any tendency to it now, such as hunting trips, camping, etc.? After how long a period is this?

With the discussion of movements we enter upon the last stage of our subject—the child's doing. Here, as in other cases, we are not preserving a strictly chronological order in our description, for as a matter of fact thinking and doing go hand in hand in mental development, each requiring the other in order for it to get beyond the rudimentary stages. So close is this connection that in the chapter on Perception we were obliged to anticipate this phase of the subject by discussing grasping in connection with seeing, and now in considering movements we shall be referring constantly to the stimulus to movement given by the senses.

Introduction

In thus discussing feeling, thinking, and doing separately, we have been guided principally by the desire to show clearly the continuity of the development of each mental process from birth to maturity, showing, for instance, how the character of conceptions and of religious ideas develops as the child matures. In thus abstracting each mental process from the others in which it is embedded, we do as does the dissector, who follows out before his class the course of but one nerve or blood vessel, ignoring for the time the complex of other nerves, blood vessels, and tissues that enmesh it. Such a separation is imperative for purposes of study, but it is only preliminary to the attempt to see as a whole the living organism in which each nerve and blood vessel plays its part. So now that the growth of the child's body and mind has been studied, as far as the present state of child-study observations allows, there comes at last the consideration of how he, with his body as a tool, learns to express his thought; for in this expression the whole childish self is most clearly revealed.

Precedent to the child's conscious and voluntary expression of thought, however, is a stage during which

he has little or no control over his movements. The activities at this stage do indeed express to us the baby's condition and his traits as a member of the human race, but he does not intend to express himself thus, and is unable either to make or prevent his movements voluntarily.

Impulsive movements are also called spontaneous, random, or automatic. In the whole discussion of the subject there is great variety both in the terms used and in the meanings attached to the terms. Some writers class as instinctive what others call reflex, and others make instinctive movements cover nearly the whole range of human activities. In a book of this nature it would be useless and confusing to discuss and weigh such conflicting claims. We shall therefore imitate Tracy in using Preyer's classification, making the same reservation that Tracy does—that the use of Preyer's classification does not bind us to accept his theory of will.

Impulsive movements

Impulsive movements are movements resulting from changes within the motor center itself. They seem to require no stimulus from outside, and no sensory elements. Many fetal movements are impulsive, and also many of the movements present at birth, although their variety is not great. There are stretchings and bendings of arms and legs; spreadings and bendings of fingers and toes; striking with the arms; stretching after waking; all sorts of grimaces; movements of the eyeballs before the eyes are opened; crowings and babblings; and the "accompanying movements," such as movements of the arms on hearing music or seeing bright colors or tasting agreeable food.

The better the health and feeding of the child, the more numerous and vigorous are the movements likely

to be. Their general use is evidently that they serve as exercises to prepare the muscles for later instinctive and voluntary action, and Mumford believes that they are also vestiges of movements that once were useful in the bodily economy but are no longer so. They are decaying instincts, so to speak.

Direction of the movements

Why they take the particular form that they do seems to depend upon the prenatal posture and the bodily structure at the time of birth, as Trettien shows. The arm and leg movements are at first always in line with the body, that is, forward and back or up and down, never out and in. In the case of the arms this seems to be due especially to the shape of the chest and shoulders. As the back straightens and the chest expands, side movements become easier. With both arms and legs, the up and down movement is also the most natural on account of the habitual posture of the baby. Trettien shows the habitual positions of arms and hands at great length, thus:[1]

Position	Male	Female	Average
Fingers—			
Clenched	83%	87%	85
Bent	12	4	8
Straight	5	9	7
Wrists—			
Bent	69	65	67
Straight	31	35	33
Elbows—			
Bent	100	96	98
Straight		4	2
Shoulders—			
Bent	66	68	67
Straight	34	32	33
Arms			
Laid in front	98	92	95
Laid at side	2	8	5

[1] The tables are based on different numbers of children, varying from 58 to 182. In all cases the tables are given in per cents.

The legs are habitually bent at the hips and knees, the feet crossed, the soles turned toward the median line and the toes curled down over the soles. The whole body tends to assume the curve of the prenatal position. With such an habitual posture for trunk, arms and legs, and fingers and toes, what other movements are probable except the stretching of the back, the unbending of arms and legs, and the spreading of fingers and toes?

These movements, as we can easily see, foreshadow the later movements—the arm movements those of reaching and grasping, the leg movements those of walking. We cannot so easily explain the extraordinary grimaces which often possess the baby's face at this time, but they probably mark the first paths of the facial expression which is to come later. We find that as voluntary movements increase, impulsive movements decrease in the normal person. Numerous connections between the sensory and the motor centers are formed by education and experience, so that the trend of development is away from impulsive movements rather than toward them. Yet Compayré maintains that some persist even in the adult.

Reflex movements

Reflex movements differ from impulsive in that they require a peripheral stimulus to call them out, but, like them, no attention or idea is necessary for the performance. They are inherited, but the baby performs them more slowly and imperfectly at first than later. This is a decided advantage, for the baby has no power to inhibit movements for some time after birth, and if the reflexes were easily started, he would be subject to convulsions.

Reflex movements may be called out even early in the prenatal life by gentle stroking, by changes of temperature, or by shock. After birth, they are numerous.

Most important of all is the group of periodic reflexes, under which come the various actions necessary to sustain life. To this group belong all the actions connected with respiration. Breathing is itself a reflex act, due to the stimulation of the air, and the cry of the newborn child is caused by the spasmodic action of the larynx when the air reaches it. At first the breathing is very irregular and rapid, sometimes almost ceasing, and then continuing with greater force and rapidity. In the seventh week there are about twenty-eight respirations to the minute; in the twenty-eighth month, about twenty-two, but even then a stimulus which is insufficient to wake the sleeping child will cause a rapid increase in the number of respirations.

Sneezing is possible even at birth, and with some babies takes the place of the first cry. Preyer produced it on the thirty-eighth day by pouring warm water on the baby's forehead; and on the one hundred and seventieth day by merely blowing in his face. The baby's eyes are always closed in sneezing.

Swallowing is present even before birth. Coughing has been observed in the first hour; choking and hiccoughing on the first day; yawning on the seventh day; wheezing and snoring on the twenty-fourth day; and sobbing not until considerably later, about the seventh month in Preyer's boy.

Other important periodic reflexes are the heartbeat, the contraction and relaxation of the arteries, the movements of the bowels, and so on. Regurgitation, which occurs as early as the first week, should also be mentioned here.

Among reflexes that are not periodic should be mentioned the group of eye-reflexes. In describing the development of sight these were discussed, and so need only be mentioned here.

The entire body reacts to get rid of unpleasant stimuli, even from birth, although it requires a stronger stimulus then than later. The pain-reflexes are the least developed of all at birth. A baby can be pricked with a pin, even until the blood comes in some cases, without reacting.

But there is a stronger response to some other stimuli. Within five minutes of birth the toes will spread out if tickled, and, like the hands, will clasp any object laid within them. The reflex handclasp is one of the most remarkable for its perfection and strength. Robinson examined sixty newborn children and found that within one hour after birth they could all hang suspended from a stick by their hands, for a time varying from two seconds to one minute. Twelve hung for one-half minute and four for one minute without crying or showing any signs of distress. The strength of grip increased up to the third week, when several hung for one and one-half minutes. Here there seems to be a distinct survival of arboreal life habits, when the baby had to cling to its climbing mother in order to preserve its own life. All the arm reflexes are stronger at first than the leg reflexes, and the arms are relatively more developed than the legs.

Other reflex movements occur to escape persistent stimuli. Preyer found that in tickling the temple the baby usually used the right hand to brush away the object; while Pflüger maintains that, as a rule, the hand on the same side is used.

At first, as mentioned above, a baby has no control over its reflex movements; they must follow when the stimulus is given, whether he wishes them or not. Preyer dates the first inhibitions between the ninth and twelfth months, when the child begins to show some slight control over bowel movements; but, although

observations are lacking, one may fairly question whether before this time there are not some inhibitions of arm and leg reflexes or of those connected with respiration. In all cases the control is irregular at first, and fails if the child is tired, inattentive, or not well.

Instinctive movements

Instinct is differently defined by different writers, and the distinction between it and reflexes is by no means hard and fast. Instinctive movements seem to differ from reflex movements principally in being more complex and in having a less developed mechanism for their performance than reflexes have.

Instinctive acts are inherited, that is, there is an inborn disposition to their performance, but they require a stimulus to start them, and they may be greatly modified or even suppressed by training. They are acts which have been serviceable to the race and are present to a greater or less degree in every member of it, but in man they vary so in their manifestations that it is almost impossible to know what actions have an instinctive root and what have not. There are, however, certain acts which are clearly instinctive.

Movements centering about the mouth

In this list belong sucking, biting, chewing, grinding the teeth, and licking. Sucking comes the nearest of any of these to a reflex act, and is sometimes classed as one because brainless children perform it as well as do the normal. It is usually complete at birth, but in some cases has to be partially taught. It lasts in its full strength until the first teeth come, but as we have already noted, for a long time most objects go to the child's mouth to be sucked and licked before the child feels that he really knows them, and even the adult likes at times to put something into his mouth to suck. Licking usually accompanies sucking, and is present even on the first day.

Biting and chewing are instinctive acts which may appear as early as the fourth month, before any teeth are through. A baby will bite and chew his fingers, his rattle, the glass he drinks from. Grinding the teeth also appears to be a common occupation. It may be done when but two teeth are through, but usually not until about the ninth month, when four teeth are through.

Holding up the head

At birth the ability of children to lift their heads varies considerably. In some, even on the first day, there is enough surplus energy to lift the head from its support; in others, not until the second or third week. The neck muscles are very small at birth, and increase in their growth to maturity to nine times their original size. At first the head, when unsupported, drops on the chest and rolls to one side. Preyer maintains that the dropping is not due to muscular weakness, but to lack of will, because even in the first week the head can turn to follow a moving light.

Miss Shinn records that at the end of the first month her niece could hold up her head unsteadily for a few seconds, and by the end of the second month could hold it steadily and continuously. Preyer's records date the act between the eleventh and sixteenth weeks, while Demme's observations on one hundred and fifty children place the event between the third and fourth months for strong children; at four and one-half months for moderately strong ones and in the fifth or sixth month for weakly ones.

The child has a strong incentive to hold the head up after the sixth or eighth week, for then convergence and accommodation of the eyes are established, so that he can see clearly. The attempts to raise the head not only strengthen the neck muscles, but those of the back and chest as well, so that they prepare the child

for erect sitting, which follows almost immediately. We have described the development of the reaching and grasping instinct at length in the chapter on Sensation and Perception.

Sitting erect

After the baby can see distinctly and has learned to hold his head up, he is very likely to resent being laid down in his crib, although before he was well satisfied with that position. Now he insists upon a sitting position, where he can see the fascinating world about him. This desire to sit up comes between the second and fourth months as a rule, and the baby will make all sorts of efforts to lift himself by a supporting finger, or by strain of the abdominal muscles. He is very unlikely to succeed, however, unless he is somewhat raised to begin with, for neither back nor abdomen is strong enough alone.

A baby who thus wants to see but cannot sit alone, should be provided with a cushioned support that will support and yet yield to movements, so that he can carry on his education without harm to himself. He will also get practice in sitting in his bath and in laps, and by some time between the fifth and eighth months will be able to sit alone on a hard, smooth surface. By the eleventh month the baby's seat is firm, although when reaching for things he sometimes tips over.

Both Preyer and Trettien insist that a baby should rather be discouraged than encouraged to sit alone, and that the back should at first be supported by a pillow. Preyer says that he should not be allowed to sit up until he has proved his fitness by raising himself without encouragement from a prone to a sitting position.

The first sitting position is very awkward. Usually the knees are bent and the soles turned toward each other like a monkey's.

In learning to walk, there are several well-defined stages. In the first place, long before the baby makes any attempts to move from the place where he is laid, his legs, as well as his arms, make various movements. These are, as we have seen, impulsive at first, but later they become a source of great pleasure to the baby, and by the third or fourth month he is kicking up his legs as much as his elaborate clothing will allow. The movements become rhythmic and alternating, evidently an advance toward stepping, and by the seventh month he will straighten and press his legs against an opposing surface and, if held up, begin to take steps. He also enjoys standing when supported. He is still, however, very far from independent walking, and goes through at least one preliminary stage, and often two or three, which are useful in strengthening the various muscles that will later be used in walking.

Locomotion

When a baby is strong enough, if laid on his back he will roll over on to his stomach, sometimes just for love of the movement, sometimes accidentally in reaching for an object. Mrs. Hall's baby turned from side to back in the ninth week, but not from side to side until the middle of the seventh month, and Miss Shinn's niece began her career of rolling near the end of the sixth month, and continued it with increasing vigor up to the eighth month, when creeping began. "She would now roll over and over in any direction, not to get anywhere in particular, but just for the fun of the thing. She varied the exercise with the most lively kicking, the heels raised in the air and brought down together with astonishing vigor and zest; or with twisting about and getting on hands and knees, or even on hands and feet, prattling joyously and having

Rolling

a beautiful time all by herself for as long as the authorities would leave her alone."

Instead of rolling, some babies stumble upon hitching. They jerk themselves along from one side to the other, backwards or forwards, in a most ungainly fashion. Where there is hitching it may precede creeping, or may take its place. Trettien gives the following per cents, based on returns from seventy-five boys and seventy-five girls, to show the usual mode of locomotion: Of the one hundred and fifty children, 60 per cent of them crept, 30 per cent hitched, 7 per cent rolled, and 3 per cent crawled, humped, made swimming movements, etc. He does not note in how many of these children both creeping and some other form of locomotion preceded walking.

Creeping

By the sixth or seventh month a baby begins to get up on to his hands and knees, and now and then to stretch or scramble for something that he wants. Some time between the eighth and eleventh months he begins really to creep. Here, also, we find all sorts of odd ways. Of the babies Trettien watched, 6 per cent crept backward at first. Both Miss Shinn and Mrs. Hall record this. It is due to the fact that the baby's arms are stronger than his legs and are predisposed to push instead of to pull, so that until he has learned to coördinate his movements he pushes himself away from the object he wants, instead of toward it. Much to his amazement and displeasure he finds it moving away instead of approaching him. However, he soons learns better.

The relative movements of hands and knees are almost as varied as the number of these members will allow. Some babies move with the opposite hand and knee down at once, but just as many move like pacers, with

the hand and knee of the same side down at once. A fairly large proportion use arms and hands alone, dragging the body and legs; and almost as many go on hands and feet instead of knees. Others crawl like snakes, with the arms close to the sides and the legs almost straight; and still others hump like worms, drawing the legs up and then stretching the arms and body forward. In all cases there are, of course, many unnecessary movements made at first that are dropped by degrees.

Climbing

We have already seen that even at birth the baby's clasp is strong enough to support him hanging, and that the first efforts to sit up are, as a rule, preceded by pulling himself up from a lying to a sitting position. The muscles of arms and hands are relatively stronger than at any other time of life, and we should naturally expect from this fact a stage when the baby's desire to use them would be marked, that is, a climbing stage. Preyer, careful observer though he was, does not even refer to such a stage, although he gives a detailed account of seizing. On the other hand, all the accounts of learning to stand show how important a factor is the ability of the child to pull himself to an erect position, and Miss Shinn and others have observed and described the climbing stage.

It seems probable that climbing is a genuine instinct, dating back to the time when men lived in trees, and when strength of arm and grasp were essential for life. But in babies the instinct is so promptly repressed by fearful mothers, and so impeded by the baby's clothes, as is also his creeping, that the discouraged child turns to some substitute instead of delighting in it as Miss Shinn's niece did. Such repression must be a hindrance to the development of the child's lungs and back, and therefore must work direct harm to his health. It is doubtless

often difficult for the mother to give the necessary supervision to the climbing if it is allowed, but it can be done more frequently than it is, and should be planned for as far as possible.

When not repressed, climbing begins at about the same time as creeping, and is shown in the baby's attempts to climb over the person holding him, to climb into chairs and on to beds and table, and above all by his insatiate desire to creep up and down stairs. In the mounting process there is really little danger, if the thing he is climbing be solid, for his grasp is very strong; but in descending, the baby is likely to come head first like any animal that goes on all fours, and not being properly proportioned for such a form of movement, he falls. If a mother can be hard-hearted enough to let him get a few bumps, he soon learns to come down backwards, and then most of his dangers are over.

Although the desire to climb lessens somewhat after the baby has learned to walk, it is strong all through childhood, as is seen in the love that all children have for climbing trees, houses, and so on.

Walking

Even before the baby has begun to creep, we have seen that he is getting exercises preparatory to walking in his alternate kickings, in the steady pressure of his feet against opposing objects, and in the various half-standing positions that he assumes when held in the lap or supported on the floor. He enjoys these exercises, but still he shows no desire to assume the erect position when left to himself, until he has been creeping for some time. Mrs. Hall notes that in the thirty-eighth week her boy pulled himself to his feet by the aid of a finger, and stood for a minute; in the forty-eighth week he pulled himself to a chair and stood for five minutes, holding on with one hand and playing with the

other, and two weeks later he stood so for half an hour. Preyer's and Miss Shinn's records correspond very closely with this, but all note that the baby does not feel very secure on his feet as yet. Demme's records show that vigorous children usually stand alone between the fortieth and forty-second weeks; moderately strong ones between the forty-fifth and forty-eighth weeks; and weakly ones about the twelfth month. Trettien says that the first standing alone may come at any time between the seventh and sixteenth months, and the first walking alone between the tenth month and the second year.

By the time that the child has become accustomed to stand alone, he has usually been given some lessons in walking and has been shown how to push a chair ahead of him. A baby will at first support himself by the wall or by the furniture in going for what he wants, but for a long time will drop down to creep when he comes to an open space. He can often walk well when supported by one finger, and alone when he thinks he is supported, for some time before he will walk alone if he knows it. With most children there is a fear of falling that hinders their walking.

Self-consciousness a factor

Their self-consciousness is shown in very amusing ways. One little girl who had always held on to her mother's dress while walking, one day seized the scallops of her own skirt and walked bravely off, performing a feat closely analogous to the famous one of raising oneself by one's bootstraps. Professor Hall's daughter chanced to walk alone for the first time when she had a pair of her father's cuffs slipped over her arms, and for several days she could walk very well with them on, but would not stir a step without them. When a child is not being constantly urged to walk, it is not infrequent for him to take his first independent

steps without knowing it, in his eagerness to get something that he wants. But as soon as he realizes that he is going alone, while he may be very proud of himself, he promptly falls, and may not try again for some days or even weeks. Then suddenly he walks alone again, and each day makes large gains, until, in a week or so, walking is preferred to any other mode of locomotion.

When walking is established

The date when walking becomes well established varies greatly. Preyer puts it in the sixty-eighth week for his son; Mrs. Hall in the sixty-sixth for hers, and others at various times between the twelfth and thirtieth or even thirty-sixth months. Where there are a number of children in the family, walking will be learned sooner, and of course a child can be taught to walk sooner than he will if left to himself. This is not a wise thing, however, unless the child is three or four years old, for a healthy child usually wants to walk as soon as his muscles and bones are strong enough to bear his weight. If he walks too soon, he is likely to be bow-legged or knock-kneed. If, on the other hand, a child has not learned to walk by the time he is three and a half or four years old, a physician should be consulted.

It is interesting to notice that when children first begin to walk alone they want some object in their hands as they walk. Is it partly because they derive some feeling of support from it, and partly because they feel the lack of the constant stimulation of the palms that they had when creeping?

The first walk is very unsteady; not infrequently it is more a run, a trot, or a waddle than a walk, and it is usually pigeon-toed. Nevertheless, undignified though it be, it opens to a child a new world both of vision and of movement. He gets new views of things when standing

—views which are to persist through life; the freedom of his hand allows his handling and fingering of objects to go on at the same time that he is walking; and the exercise of his legs leads to marked changes in the bodily development. His appetite increases, his hours of sleep lengthen, and his general health improves, especially if he is a sickly child. His disposition is likely to become more amiable.

In describing these stages in locomotion we have proceeded as if the growth were continuous, but as a matter of fact it is not. Some movement will appear, be practiced for a day or two, and then be neglected for several weeks or even months. Then suddenly it will reappear and be practiced diligently until it is learned. Walking is likely to be interrupted by the beginning of speech, and vice versa, so that the two processes of learning to walk and of learning to speak, which stretch over several months, have periods of waxing and of waning. **Rhythms of growth**

The relation between the age of walking and talking and general intelligence has been studied by C. D. Mead upon twenty-five normal boys and twenty-five normal girls, and one hundred and forty-four "schoolable" feeble-minded children. He defines "walking" as taking a step unassisted, and "talking" as using a word intelligently, that is, associating the idea with the object. The median normal child begins to walk at 13.54 months, and to talk at 15.8 months. In walking, the range of variation is from eleven to thirty months with 90 per cent of the cases between eleven and seventeen months. In talking, the range is from nine to twenty-five months with 90 per cent between ten and twenty-one. In both cases, as well as with the sub-normal children, the girls learn at an earlier age than the boys.

The median feeble-minded child begins to walk at 21.6

months, with the extremes at twelve and seventy-two, and 90 per cent between thirteen and fifty. He does not begin to talk until 34.4 months, with the range between twelve and one hundred and fifty-six months (but only one case above one hundred and eight months). Ninety per cent of the cases are between fourteen and eighty-four months.

These returns are extremely significant if they are representative, as indicating that the limits of normality in learning to walk and talk are not as great as was formerly supposed. They are still more emphasized by data quoted from Ireland and Tredgold on idiots, showing that the development is still later in this class of defectives.

Sexual instinct

The sexual instinct has already been discussed in a previous chapter, and hence will only be mentioned here. Closely connected with the instinct of sex is the parental instinct, which seems also to be the center of a large group of acts which are not commonly considered instinctive. We can hardly question that the care of the helpless young is instinctive, but we do not usually look upon teaching and philanthropy in all its forms as instinctive. What we know of social evolution, however, seems to point to the fact that altruistic activities in general have been the outgrowth of the instinct to care for helpless children. The original instinct has become so covered, so varied, and so modified in its expressions, that it seems a misuse of terms to call philanthropy instinctive; and yet, within the genuine philanthropist there is some impelling force that cannot be turned aside by reasons or difficulties or even his own willing. He springs to relieve the suffering even of the most worthless, as the mother springs to snatch her child from danger.

Parental instinct

From this standpoint, Mr. Phillips's investigations as to the existence of a teaching instinct do not seem

unreasonable. He found that girls play dolls and teacher far more than boys do. Out of one hundred and five teachers, fifty-one had desired from childhood to follow that profession; seventeen wanted to at the age of twenty-three; twenty-four were forced to teach, but soon grew to love the work; and only four heartily disliked it. He concludes that teaching is probably a special form of the parental instinct, manifesting itself, as that instinct does, more strongly in women than in men.

Other possible instincts

Besides the instinctive movements already described, on which most writers are agreed, there are numerous other groups of movements which one or a few writers class as instinctive. Among these are the migrating instinct, which appears in the desire that most children have to run away; the hunting instinct; the burrowing instinct, appearing in fondness for cave making; the swimming instinct; the tent-living instinct; the collecting instinct or the instinct for property. Most children show these tendencies at some time in their development, and it seems probable that they are genuine survivals of ancestral traits. They are less definite in their form than the movements we have been discussing, and so lend themselves with especial ease to modification and are the basis of education in the form of natural interests. (The chapter on Nature versus Nurture discusses them.) Still other acts often classed as instinctive are the expressions of the instinctive emotions—laughing and crying, the expressions of fear, anger, and so on, which have already been considered, and finally we have such things as language, imitation, play, constructiveness, workmanship, classed as instinctive at bottom. The separation of the learned from the unlearned factors, and a clear description of the latter, would be of much value to education.

REFERENCES

Bernhardt, W. Natural Impulses. *Am. Nat.*, 1897, Vol. XXXI, 582-587.

Black, J. W. Savagery and Survivals. *Pop. Sc. Mo.*, Vol. XLV, 388-400.

Brooks, W. K. Study of Inheritance. *Pop. Sc. Mo.*, Vol. XLVIII, 480-491, 617-625.

Bryan, E. B. Nascent Stages and Their Significance. *Ped. Sem.*, 1900, Vol. VII, 357-396.

Buckmann, S. S. Babies and Monkeys. *Nineteenth Cent.*, Vol. XXXVI, 727-743.

Compayré, G. *Development of the Child in Later Infancy.* Chapter IV. Appleton, N. Y. $1.20.

Darwin, C. Biographical Sketch of an Infant. *Pop. Sc. Mo.*, Vol. LVII, 197-205.

Ellis, Havelock. Analysis of the Sexual Impulse. *Alien. and Neur.*, 1900, Vol. XXI, 247-262.

Emmons, B. E. Humane Instincts of Children. *Jour. of Ped.*, 1900, Vol. XIII, 110-116.

Groos, K. *The Play of Man.* *See* Index. Appleton, N. Y. $1.50.

Hall, Mrs. W. S. First Five Hundred Days of a Child's Life. *C. S. M.*, Vol. II. *See* Index.

McMillan, Margaret. *Early Childhood*, 27-47. Bardeen, Syracuse. $1.50.

Marshall, H. R. *Instinct and Reason.* Macmillan, N. Y. 574 pp. $3.50.

Mead, C. D. Walking and Talking in Relation to General Intelligence. *Ped. Sem.*, Dec. 1913, 460-48.

Mezes, S. G. Essential Differences between Man and Other Animals. *Texas Acad. of Sc.*, 1898, 23-27.

Mills, W., *et al.* Instinct. *Science*, N. S., 1896, Vols. III and IV.

Moore, Mrs. Kathleen Carter. Mental Development of a Child. *Psy. Rev.*, Monog. Sup. No. 3, 1896.

Morgan, C. L. Swimming Instinct. *Nature*, 1901, Vol. LXIV, 208.
Instinct and Experience. Methuen, Lond., 1912, 299 pp.

Oppenheim, N. *Mental Growth and Control.* Chapter V. Macmillan, N. Y. $1.25.

Preyer, W. *Senses and Will.* Chapters on Impulsive, Reflex, and Instinctive Movements. Appleton, N. Y. $1.50.

Reid, G. A. Prehensile Power of the Hands of the Human Infant. *Lancet*, 1897, 1077.

Robinson, L. Primitive Child. *N. Am. Rev.*, Vol. CLIX, 467-478.

Rowe, S. H. *Physical Nature of the Child.* Chapters II and XI. Macmillan, N. Y. $1.00.

Scripture, E. W. Arousal of an Instinct by Taste Only. *Science*, N. S., 1899, Vol. IX, 878.

Shinn, Millicent W. *Biography of a Baby.* Houghton, Mifflin, Boston. $1.50.

Swift, E. J. Heredity and Environment. *Proc. N. E. A.*, 1898, 910-916; *Am. Phys. Ed. Rev.*, 1898; *N. W. Mo.*, 1898, 36-41.

Taylor, A. R. *Study of the Child*, 93-105. Appleton, N. Y. $1.25.

Tracy, B. *Psychology of Childhood.* Chapter on Movements. Heath, Boston. $0.90.

Trettien, A. W. Creeping and Walking. *Am. Jour. Psy.*, 1900, Vol. XII, 1-57.

Worthington, S. M. Inheritance of Mutilations, etc. *Med. Rev.*, 1897.

Wundt, W. *Human and Animal Psychology.*

See also the individual studies and general books of reference.

CHAPTER XV

Growth in Control of the Body

Observations

1. To observe the increase in control of the muscles, compare children two, four, eight, and fourteen years old. Note the difference in ability to move the fingers separately, either horizontally or up and down, to stand still on tiptoe, and to thread a needle.

2. Have children of different ages sort out colors, and note the differences in accuracy.

3. Have them tap a finger regularly, as long as they can, and note the differences in regularity and in length of time. In all these the fourteen-year-old child will probably be little, if at all, superior to the eight-year-old.

4. Notice whether the brightest children of your acquaintance are the quickest and the most accurate in their movements.

5. Provide your children with simple tools, needles, etc., of their own, and encourage them to make their own toys, playhouses, etc., as well as articles for use about the house. Show them how to use the tools, and see that they complete whatever they begin.

6. If you are observing one child systematically, give the tests mentioned in (1) at regular intervals, and take pictures if possible.

Introduction

Leaving now the exclusively physiological side of the subject, we shall consider how a child learns to use his body, and how much he improves from babyhood to youth. In many parts of our country a revival of all sorts of hand work is shown by classes in lace making, spinning and weaving, carpentry,

basketry, and so on. While there may be more or less of the fad in this, it is nevertheless very suggestive to the sociologist and to the educator, because it indicates a feeling of the value of "handiness."

Whether we look at the matter historically or logically, we can see that in the end our civilization depends upon our ability to control our bodies, especially our hands. Without such ability, neither literature nor machinery nor any other expression of thought is possible, and it is still an open question how much the power of thought itself is dependent for growth upon an organ that is adaptable, like the lips and hands, and how far it has created the organ by use. It is therefore valuable to study how the baby learns to use that wonderful organ of the mind, his body, and especially how both child and adult learn to use their hands.

The baby's control of his body

At birth a child has no power to make voluntary movements of any sort. When an arm or a leg moves, when his eyes close at a bright light, or when he starts at a loud sound, the movement is a total surprise to him, something that he can neither prevent nor repeat. He gets, at the most, vague feelings, without any knowledge of their cause or connection with each other, or with other feelings, and he does not as yet know the difference between feelings arising from his own movements and those due to outside stimuli, such as light and sounds.

But these vague feelings become more distinct by repetition, and as the connective fibers within the baby's brain grow, the various feelings become associated with one another. The eye sees the aimless movements of the hand, and, after many accidental successes, is able to guide the hand to the mouth. The first accidental grasping of the breast in the aimless groping of the hand

gives a basis of feeling for the intentional reaching when the baby is hungry.

The wonderful change in a baby that usually occurs about the sixth month of his life is due very largely to his discovery that he can move himself this way or that as he pleases, and can direct his movements by his eyes.

In the last chapter we traced the gradual increase in the power to control the trunk and larger muscles of the body, in holding up the head, sitting erect, rolling, creeping walking, and grasping and holding. The smaller muscles of the face are also controlled to a large degree in feeding, talking, and in the various expressions of the emotions, though the connection with instinctive movement is very close here and it is difficult to know when the transition from instinctive to voluntary movement occurs.

Growth in muscular control depends not only upon the normal development of the muscular system but equally upon that of the nervous system. So close is the relation between the two that under the name of neuro-muscular system they are frequently considered together. Again, mental development is closely bound up with nervous and motor development, for the material of knowledge, sensation, cannot be acquired to any great degree without movement, even when the sense organs themselves are perfect. An immobile eye or hand would lose a large part of its use, and, in the course of time, of its sensitiveness as well. The question of growth in motor control and its value and significance for mental development is therefore an important one, and various tests have been made to show the improvement with age.

Neuro-muscular system

First with regard merely to increase in the muscles, we should note that the various muscular systems do not all grow equally together, but sometimes one and

sometimes another is more prominent. Thus Tyler tells us that at about four years of age the legs are growing more rapidly than the other muscles, and Hall says that in the adolescent growth leg growth comes first, then biceps and back, and later still forearm. Puberty is a period of rapid increase in strength as well as of rapid growth.

General body control

To what degree should there be systematic physical training of the little child? A baby, as we have already seen, is indefatigable in exercise if he is healthy, and if he is not trammeled by clothes or by his mother's fears he is likely to get an all round development. We know, however, that both a baby's strength and dexterity can be greatly increased if the parents put him through regular exercises, but whether such work is necessary or even desirable is a question, unless the child is evidently weak in some direction. After he can walk he acquires by degrees various refinements of walking—jumping, hopping, balancing—and in climbing still other forms of control are established. Rather than formal training, we should advise that the childish activities of play and imitation be such as to use all parts of the body spontaneously. By the kindergarten age rhythmic movements are enjoyed, though in very different degrees by different children, and rhythmic plays and exercises become important educational agencies. They shade over by degrees to dancing, which Dr. Hall considers one of the most valuable forms of training that we possess.

Dancing in this broad sense includes all emotion and thought expressed in rhythmic motion. It demands control of all the larger muscles of the body, and expresses the whole self better than anything else. It again shades over into the dramatic art with all its educational possibilities. Both these forms of exercise have so many

social and intellectual aspects that we shall reserve discussion of them for other chapters. In general, we may say that the child acquires the increasing control of his body through his spontaneous play far more than through any other agency. His toys are a large factor here.

On the side of formal education the control of the hand is the most important single factor. The significance of the hand in the evolution of man can hardly be overstated. McDougall tells us that the hand has, in phylogenetic history, been successively used for locomotion, support, suspension, and at length for manipulation. Since man has learned to walk erect and the hand has been freed from its work of locomotion, few structural changes have occurred, but great functional changes. In order to become a real hand, it must lose its hair, so that the sense of touch may become delicate. The skin must become thinner, so that more delicate stimuli may be felt, and the claw or hoof must give way to the short nail, so that the tips of the fingers may be used. Again, the fingers have become longer, especially the last joint, probably the bands of muscles crossing the phalanges have become narrower, so that the fingers move more freely and independently of each other; the thumb especially becomes opposed to the other digits, and the connections of hand with brain become more complex.

Evolution of the hand

We have already seen how the child's power to grasp develops. Let us summarize briefly the various investigations on other forms of hand or finger control. The power of hand grip is closely correlated with mental vigor. Between eleven and sixteen both boys and girls nearly double their dynamometer grip, and there seems to be a parallelism between the increase in the grip and the increase in weight.

Growth of finger control

Tests for the greatest number of taps in a given time show, according to Bryan's returns, a steady increase from six years to sixteen for boys, with a lowering at fourteen for girls and a later rise. Gilbert found a similar decline at twelve for both boys and girls, while in the Chicago tests the greatest improvement for boys occurred in the thirteenth year and for girls in the tenth, thirteenth, and fifteenth years. Bolton found that in general the children bright intellectually could improve most and resist fatigue best in tapping tests.

Tests for accuracy of finger movements, though of very different kinds, all seem to indicate that from about five years of age on, for two or three years, there is a marked improvement in accuracy, while at puberty there is little or no gain, and sometimes deterioration. Tests for discriminating weights, however, show maximum correctness of judgment at thirteen with girls and at fourteen with boys.

Power to resist fatigue, measured by the ergograph, seems to improve rather steadily from six to twelve; then there is a sudden acceleration for two or three years, and later a relative decline.

These data, meager indeed when we consider the importance of hand control to the individual, show us little of educational importance, except possibly that about six and thereafter we can safely allow the child to undertake tasks that we could not before. We still have unsettled the important questions of when to begin writing, the place of manual and industrial training, of drawing and plastic art, of domestic economy. How much hand control should a child have when he enters school? We cannot say definitely. We know that under the Montessori method four- and five-year-old children can do everything involved in dressing and undressing

(if the clothing unfastens in front), can carry a soup plate without spilling the soup, can trace the insets and sandpaper letters, and in many cases can write without following copy. Kindergarten children do paper weaving, string coarse beads, outline drawings with a coarse needle and wool. Children are able to handle a fork and spoon tolerably well, to cut with scissors, and so on.

The possibilities here are always bound up too with the possible strain on the eyes. How closely ability to make fine movements is correlated with visual ability to follow those movements we do not know. Whether small children perform all the acts above referred to without overfatigue is still a matter of question. For some time educators have been saying that writing should not be learned before the child is eight or nine years old, because it requires the use of delicate muscles over which a little child cannot exercise control without too great nervous strain. The Montessori system, however, does not seem to fatigue the children. Perhaps we need here to define more closely what is meant by writing. Under the old method, by which the child was required to use a ruled sheet and to write in small characters, the strain was much greater than when he uses free movements, and writes very large, without a line. It is difficult to see why, in the latter case, there is any more strain than in his free drawing. We very much need some careful observations of children from kindergarten age to adolescence, in order to find out what hand activities they indulge in spontaneously at different ages.

Turning from the consideration of age, however, there is no question of the value of manual work in all its forms, but this value differs greatly. We can only touch upon these variations briefly. A subject has educative value in proportion as it performs many functions in

one. Our curriculum is too crowded to allow of training each part of the child by itself, and even if we could, life demands complete functioning rather than abstract activity. The earlier systems of manual training which are still in use in many places, erred in making manual skill nearly the whole consideration. They taught the boy or girl no trade, made few or no useful things or toys, but drilled on making square joints, using the tools well, and little else. Also they paid little attention to teaching the pupils hygienic positions in using the tools, they strained the eyes, and had other bad physical effects.

The tendency now is, to a large degree, to replace this work by various forms of industrial training and domestic science. Such work has the advantage of preparing the pupils for a specific trade, and thus satisfying pressing economic needs both for the child and the community. The training varies greatly in different places. It is probably most developed in Munich, where nearly every trade is taught. The half-time system, in which a boy works in the shop a half day or a week, and spends the other half day or week in school, two boys "spelling" each other, has met with great success in some places.

Such industrial training, however, can hardly be taught below the grammar grades, and there is still the question of what preparation shall be given for it in the elementary school work. In general, the plan which was followed under Dr. Dewey's guidance in the School of Education seems to justify itself best. It is, in brief, that in these years the school should offer in carefully chosen forms the typical activities of man, so that by degrees the children shall come to an understanding of the life about them. These activities focus about getting food, clothing, and shelter—cooking, spinning, weaving

and sewing, carpentry, and their various modifications. The making and furnishing of a doll's house, clothing the dolls, and other occupations offer numerous possibilities for the younger children. For the older, the activities need to be on a larger scale, preparing some of their own meals and clothing, or making a playhouse for themselves. Every normal child loves such activities, and they are the natural centers from which, through his social nature, he works out to an interest in natural science and in other people and other times. The instinct of imitation leads him to play at house, at hunting, at dressmaking, reproducing in miniature the life about him. Thence he is led to question what people did for clothes when they had no needles, how they killed animals when they had no guns, and so on.

But, and here we connect with hand work again, when a child thus begins to question how a certain people lived or how a certain food is obtained or how a certain machine runs, the best understanding is obtained by his living the life, preparing the food, or making the machine; and the association fibers of the brain are most rapidly developed by this activity. A child has but a small store of memories to fall back upon and cannot construct in imagination with any accuracy such a process as weaving, even of the simplest kind. He must, at least in a crude form, go through the essential parts of the process himself before he can have the feelings and motor associations necessary for understanding it. Still more, by doing it himself he is able to enter into the feelings and thoughts of the weaver. By planting and raising wheat, he not only understands farming better, but also the farmer. He is broadening his sympathies, for the basis of all sympathy is ability to put oneself in another's place, and we cannot do this

unless we have had the same experiences as he. This strong plea can therefore be made for hand work in our schools—that it will do away with the foolish notion that the trades are of less worth than the professions, and will train children to a genuine sympathy with all workers, thus leveling the artificial distinctions of our social life and helping to solve our labor problems.

Importance of action

Finally, on the side of action, only the actual doing of a thing will develop the skill, accuracy, and patience which are essential in the attainment of first rank in any profession.

From all sides it seems, therefore, that the expression in sensory form of any valuable thought is necessary for the complete understanding of the thought as well as for the broadening and strengthening of the feelings and of the will. Accordingly, we would make an earnest plea to parents and teachers to do their utmost to give the children in their charge every opportunity to express their ideas. This does not require the introduction of expensive outfits in cooking, manual training, and so on, so much as it does ingenuity in using the materials at hand. Wonders can be done with a hammer, saw, and jackknife, with an old stove and a few tin pans, with a doll and some pieces of cloth, with weeds, pliable twigs, and tough grasses, with sand, mud, and clay. All these things are at hand for nearly every one. The important thing is that the children shall become accustomed to expressing their ideas.

Efficiency

From the side of vocational guidance such work is also of great value, for it reveals the individual interests and abilities of children to a wonderful degree, and from the side of efficiency it is probably more valuable still. The business world has been greatly startled of late by the studies of

Gilbreth, Emerson, Taylor, and others, which have shown the great industrial wastes of our present systems. These come in various places—in bad office systems, bad bookkeeping, bad systems of letter and information files—but quite as much in wastes in the movements necessary for doing a piece of work. Studies of the movements made in brick laying, for instance, showed that nearly half of them were unnecessary, and that by having the bricks on an elevation so that they could be taken without stooping, a large amount of the brick layer's time could be saved. The net result under the efficient system was that he did three times the work that he did before. Similar enormous gains were made in coal shoveling, loading pig iron, and in other forms of work.

To the psychologist the significant fact here is that the workmen who had been in such work for years had never observed the waste, and that a large proportion of them could never be trusted to stick to the better way. While certain social factors contributed to this unwillingness, another factor probably is that the efficient system demands more constant attention than does the old one.

If, now, the school is to be of assistance in giving hand control, surely it can do some of its best work in teaching children to make all their movements efficient. There are wasteful and effective ways of holding a book, using a pencil, erasing a blackboard; of walking, sitting, standing; of driving a nail, sawing a stick, boring a hole. Housework offers no end of opportunities for "making one's head save one's heels," and each one should be utilized. Many of these ways are easy to be seen even by children, if once they are alert for them, and the gain in the course of a year is far greater than most of us realize.

REFERENCES

Anderson, William S. Studies in the Effect of Physical Training. *Am. Phys. Ed. Rev.*, Vol. IV, 1899, 265-278.

Ballard, P. B. *Handwork as Educational Medium.* Sonnenschein, Lond., 1910, 194 pp. Essay I, I-III.

Berry, T. W. *Pedagogy of Educational Handicraft.* Blackie, Lond., 1909, 100 pp.

Bibliography on Industrial Education. Bull. No. 2 of Nat. Soc. for Promotion of Ind. Ed., July 1907, 32 pp.

Bibliography of Physical Training. English Titles, 1905-11. Phys. Dir. Soc., Y. M. C. A., 1912, 172 pp. $1.00.

Bogardus, E. S. Fatigue and Industrial Accidents. *Am. Jour. Soc.*, 1912, Vol. XVII, 512-539.

Bolton, T. L. Relation of Motor Power to Intelligence. *Am. Jour. Psy.*, July 1903, 351-367.

Book, W. F. The Psychology of Skill. *U. of Montana Pub.*, 1908, Vol. VI, No. 1.

Burk, F. L. From Fundamental to Accessory. *Ped. Sem.*, Oct. 1898, 5-64.

Burnham, W. H. Hygiene of Physical Training. *Am. Phys. Ed. Rev.*, 1909-10, Vols. XIV and XV. Series of Articles. Bibliog.

Busser, R. C. *German System of Industrial Schooling.* Phila. Pub. Ed. Assn., 1913, 63 pp.

Carlton, Frank T. *Education and Industrial Evolution.* Macmillan, 1908, 320 pp.

Chambers, Will G. Motor Activity in Primary Education. *Jour. of Ped.*, 1905-6, 166-184.

Crichton-Brown, James. Growth: Somatic and Cerebral. *Child Study*, 1911, 77-92; *Child*, 1911, 2, 1-16.

Crile, G. W. Phylogenetic Association. *Bos. Med. Surg. Jour.*, 1910, 893.

Dearborn, G. V. M. Attention . . . and Physical Education. *Am. Phys. Ed. Rev.*, 1911, 26-40; 125-143; 186-199.

Physiology of Self Control. *Mind and Body*, June, 1912.

Moto-Sensory Development. Warwick and York, 1910, 212 pp.

Dopp, Katharine E. *Place of Industries in Elementary Education.* U. of Chicago Press, 1903, 208 pp.

Industrial and Social History Series. Rand McNally and Co., Chicago. (Readers for children summarizing in story form the history of man, with suggestions to the teacher for hand

work, etc. Those now published are *The Tree-Dwellers; Early Cave-Men; Later Cave-Men; Early Sea People.* Valuable.)

Emerson, Harrington. *Efficiency.* Engineering Mag. N. Y., 1912, 224 pp.

Twelve Principles of Efficiency. Engineering Mag. N. Y., 1912, 423 pp.

Féré, Ch. Le main, la prehension et le toucher. *Rev. Phil.*, 1896, 621-636.

Gesell. *Normal Child and Primary Education.* Section on the Hand.

Gilbreth, F. B. *Motion Study.* Van Noste and Co., N. Y., 1911, 116 pp.

Gulick, Luther. *Physical Education by Muscular Exercise.* Blakiston, Phila., 1904, 67 pp.

Hall, G. Stanley. *Adolescence and Youth.* *See* Index.

Hancock, J. A. Motor Ability. *Ped. Sem.*, Oct. 1899, 9-29; also *Am. Jour. Psy.*, Oct. 1895, 308-313.

Harvey, L. D. Manual Training in Grades. *Proc. N. E. A.*, 1905, 121-134.

Hewitt, T. H. Handicraft as Factor in Mental Evolution. *Child Study*, 1909, 83-92.

Hylan, J. P. Apperceptive Basis of Manual Training. *Ed.*, 1906, 324-341.

Johnson, W. Smythe. *Experiments on Motor Education.* Studies from the Yale Psy. Lab., 1902, Vol. X, 81.

Kent, E. B. *Constructive Interests of Children.* Colo. U. Studies, 1903, 79 pp.

Kerschensteiner, Georg. Continuation Schools. *Sch. Rev.*, Mar. and Apr. 1911.

Three Lectures on Vocational Training. Chicago Commercial Club, 1911, 52 pp.

Trade Continuation Schools of Munich. Nat. Soc. Prom. Ind. Ed., 68 pp.

Lancaster, E. G. Warming Up. *Colorado Psy. Studies*, No. 7, 1898, 16-29.

McDougall, Robert. Significance of the Human Hand. *Am. Jour. Psy.*, Apr. 1905, 232-242; *Pop. Sc. Mo.*, Sept. 1904.

McKenzie, R. T. *Exercise in Education and Medicine.* U. of Pennsylvania, Phila., 1909, 393 pp.

Major, David R. *First Steps in Mental Growth.* Macmillan, 1906, 360 pp. Sections on Hand and Drawing.

Mead, Geo. H., *et al. Report on Vocational Training.* City Club of Chicago, 1912, 315 pp.

Meyer, Max. *Fundamental Laws of Human Behavior,* 1910.

Moore, Mrs. K. C. Development of Movements. *Ped. Sem.,* June 1901, 231-238.

Mosso, A. Psychic Processes and Muscular Exercise. *Clark Univ. Pub.,* Dec. 1899, 383-395.

Münsterberg, Hugo. *Psychology and Industrial Efficiency.* Houghton, Mifflin, 1913, 320 pp.

Newton, R. C. Reawakening of the Physical Conscience. *Pop. Sc. Mo.,* 1907, 156-164.

Orr, Wm. Physical Training in the High School. *Ed. Rev.,* 1906, 42-55.

Person, H. S. *Industrial Education.* Houghton, Mifflin, 1907, 86 pp.

Physical Education and Improvement. Reports of National League for London.

Rathmann, C. G. *Mission of Manual Training.* Washington Univ., St. Louis, 1909, 23 pp.

Row, Robert K. *Educational Meaning of Manual Arts and Industries.* Row, Peterson & Co., Chicago, 1909, 248 pp.

Russell and Bowser. *Industrial Education.* Teachers College, Columbia University Pub., 1913, 50 pp. $0.65 or $0.30.

Rutgers, Henry A. *Psychology of Efficiency.* Woodworth's Arch. of Psy., June, 1910, 88 pp.

Sargent, D. A. *Physical Education.* Ginn, 1906, 311 pp.

Sargent, Walter. *Fine and Industrial Arts in Elementary Schools.* Ginn, 1912, 132 pp.

Selden, F. H. Manual Training. *Am. Sch. Bd. Jour.,* 1910, 69 pp.

Shepardson, Ed. Critique of Doctrine of Fundamental and Accessory Movements. *Ped. Sem.,* 1907, 101-116. Bibliog.

Smith, Theodate L., and Brown, Emily F. On the Education of Muscular Power and Control. *Studies from the Yale Psy. Lab.,* 1894, Vol. II, 114.

Snedden, D. S. Industriai Education. *Man. Tr. Mag.,* Oct. 1908, 1-30.

Swift, E. J. Psychology and Physiology of Learning. *Am. Jour. Psy.,* Vol. XIV, 1903, 201-222.

Taylor, F. W. *Principles of Scientific Management.* Harper, 1911.

Tyler, John M. *Growth and Education.* Houghton, Mifflin, 1907, 294 pp.

Watson, J. B. Behavior Monographs. Cambridge, Mass., 1911. Vol. I.

Wells, F. L. Tapping Tests. *Am. Jour. Psy.*, 1908, 345-358; 437 483; 1909, 38-59 and 353-363.

Woodworth, R. S. *Accuracy of Voluntary Movement.* Macmillan, 1899, 114 pp.

Wright, W. R. Some Effects of Incentives on Work and Fatigue. *Psy. Rev.*, 1906, 23-34.

For current articles on all phases of physical work and training, sports, etc., *see* the *American Physical Education Review*, edited by Dr. J. H. McCurdy, Springfield, Mass. $3.00. (Excellent also for bibliographies in English.)

CHAPTER XVI

Imitation and Suggestion

1. Keep a dated record of some child's imitations during the first year. Note:

(1) Their character. Compare the movements with reflex and instinctive movements.

(2) Their relation to walking and talking. Do they precede these or not? If not, is there a period of rest in the walking and talking when they begin?

Observations

[redacted]ep a similar record of some child between two and seven years of age, or get observations on a number of children, following Miss Frear's plan as given in this chapter.

3. Try Mr. Small's experiment, or a similar one. This is very easily done in any room where there is gas or a coal stove by pretending to smell the gas, or with other materials by pretending that meat is a little tainted, or milk a little sour, or butter a little strong.

James says that "all consciousness is motor." To understand better what this quotation means, let us turn to the development of the nervous system. We find here, that, in general, the men with the greatest mental activity are men with the best developed nervous system; and that this is true all the way down the scale of life. The animal with little or no nervous system, like the oyster or the clam, has little mental activity. We find also that uniformly in the nervous system there is a connection

"All consciousness is motor"

between those brain cells that receive a stimulus and those that send messages out to the muscles of the body, so that every impression received tends to call out some muscular response; in other words, "All consciousness is motor." Every idea, even, is reflected in the muscular system and so makes some change in the body. This is shown in a multitude of ways.

1. Professor Mosso has made careful experiments to find out what is the effect upon the body of stimulations that arouse emotions, and also to discover the bodily changes caused by changing ideas. He found that when various substances were put into the mouth or when the skin was touched or the eye stimulated, there was always some corresponding change in the circulation and respiration. He also found that mental work, such as sums in mental arithmetic, changed the character of breathing and circulation.

2. Such facts as those of muscle-reading prove the same thing. In muscle-reading there is always physical contact between subject and operator. The operator knows where an object is hidden which he wishes the subject to find, and he keeps his mind fixed on the place where the object is. This fixing of attention leads to involuntary contractions of the muscles that guide the subject toward the place, if he is sensitive enough to perceive them.

3. The facts of hypnotism are too well known to need description here. We mention hypnotism because its essential characteristic is that the subject is in some way given an idea which fills his consciousness, and therefore *must* be carried out into action. What is called the "control" of the hypnotist over the subject depends entirely upon how well he can fill the subject's mind with the ideas which he wishes him to act upon.

4. There are many facts in our everyday life that illustrate the same thing. When there is no conflicting idea in our minds we act upon any idea that comes into it. If we see a pencil, we make marks with it; if a pin is on the floor, we pick it up; if we put on our hat, we also put on our coat and gloves, and so on.

Habitual acts come under this head; the act once started is finished because we have no opposing idea.

This carrying out into action of an idea that in any way enters the mind, depends, we have just said, on the absence of conflicting ideas. This, in turn, depends upon the number of associations that one has with an idea, and the amount of attention fixed upon the idea. The more the attention is fixed, the more likely is the idea to be carried out; and the fewer the associations, the less likely are opposing ideas to rise. Children have fewer associations than grown people, and hence believe everything that is told them. Their attention is also easily attracted. On both accounts, then, the tendency is for them to carry out into action at once anything that attracts them, and therefore children are more imitative than adults.

Condition of imitativeness or suggestibility

Imitation means, in its widest sense, the copying of some idea, received from some person or object, in the form in which it was received. Thus one may imitate the pose of a statue, the bark of a dog, the movement or the voice of a friend. One may also imitate motives as far as one knows them.

The questions immediately before us are these: When does imitation rise, and when ebb? How strong is its power over the child? What does he imitate? And what use can we make educationally of this tendency?

Imitation is now usually classed as a genuine instinct.

It is an inborn tendency common to all children, but undeveloped at birth. At first, a child's acts are reflex and involuntary, and not until between the ages of four and six months does real imitation begin. From that time to the age of seven, imitation is the principal means of education. This is simply another and more specific statement of the fact that all consciousness is motor. There is some bodily change in answer to any stimulus, and in imitation the body merely reproduces in the same form the stimulus that it receives.

Rise of imitation

Preyer remarks that the very first imitations of the baby are imitations of movements that he already knows and does without any such stimuli. In the case of his son, it was the pursing of the mouth, and occurred in the latter part of the fourth month. Miss Shinn notes for the same time some possible imitations of sounds, but is dubious about their being true imitations. Even if there are genuine imitations at this early age, they are infrequent, and the most patient encouragement of the child will not call them out except to a very limited extent. The connective fibers between the sensory and motor brain regions, which are essential before imitation can occur, have not yet developed to any great extent, and do not until about the ninth month, at which time imitation becomes much more frequent. In the sixth or seventh month there are some clear cases of imitation, but even then they are relatively few, while from the ninth month on, the baby imitates all sorts of movements and sounds—combing his hair, shaving himself, and sweeping and other household tasks. By two and a half years the child is into everything, imitating his elders, and wanting to help in every way. The great development in the ninth month certainly has a close connection with

the rise of creeping and language and the growth of perception, but we lack observations which would reveal the exact order of development and the causal relations between these processes.

In these first imitations, the child imitates most readily the movements that he already performs reflexly or instinctively. Beckoning or waving the hand in "bye-bye" is one of the first imitations, and in the beginning is only a repetition of the natural movements of the arms. But even before such a voluntary imitation occurs, the child is very likely to reproduce unconsciously movements or sounds, such as a smile or a cough. Later he will also do this, but when asked to do it, either does it very poorly or not at all, and always hesitates for some seconds before he can get the necessary movements started.

Imitation being well developed by the second year, the question is of great interest as to what the child imitates and how he does it, and investigations have been made of which the following is Miss Frear's summary:

What a child imitates

	3 YEARS	7 YEARS
What the child imitates:		
1. Animals	5%	10%
2. Children	10	10
3. Adults	85	80
Kind of imitation:		
1. Direct	35	15
2. Play	50	80
3. Idea	65	75
The characteristics imitated:		
1. Speech	15	10
2. Action	70	80
3. Action, speech, and sound	75	60

Now it is both interesting and important to notice that 85 and 80 per cent of the child's imitations at three and seven years, are of "grown folks," and this is still

more important when we add, what is not given in the table, that most of these are imitations of the teacher's actions and speech. It seems difficult to overestimate the influence of the teacher over the child less than seven years old. After that age, imitation becomes less prominent because, as a child gets more ideas, he has more things to choose from and is more likely to combine them in ways of his own.

We should notice also that by the time the child is three years old the direct imitation of movements and sounds, which is his only mode of imitation at first, constitutes only 35 per cent, and at seven years only 15 per cent of his imitations, while play, which allows change and invention, constitutes 50 to 80 per cent at the two ages; and imitation of ideas, which includes many plays, is the most important factor. This change from imitation of movements to imitation of ideas in play, is coincident with the development of memory and imagination that we have already described, and with the beginnings of questioning.

The large proportion of imitations of movements marks once more the necessity, so often mentioned, of giving children plenty of freedom for activity; while the numerous imitations of adult activities strongly emphasize both the social nature of the child and the ease with which education can at this time introduce him to the work of the world in a play form. The more we study the children themselves the more do we become impressed by the fact that a grown person who is unsocial and lazy is one who has been warped from the natural order of growth.

Deahl's returns from twenty-two boys' and sixteen girls' schools (average ages of boys sixteen and of girls seventeen) as to the qualities of the leaders imitated by

the pupils show that imitation has a wide range. Size and age alone may cause either a boy or girl to be imitated, but wealth and position and school rank seem of little importance. Among the boys, athletic prowess and such qualities as courage and energy lead, and among the girls, beauty and dress. Moral goodness is by no means always present in the leaders.

Questionnaires issued to teachers asking whether they imitated their own teachers for good or bad, and whether and in what respects their pupils imitated them, showed that four fifths of the teachers were imitated, the leading points of imitation being in dealing with disorder, lesson plans, use of illustrative material and devices, and in slightly smaller numbers in personal mannerisms, tone of voice. Four fifths of the same teachers believed that the imitative pupils were those who profited most by instruction.

Imitation has been classified in various ways. First, there is the division into reflex and voluntary. In reflex imitation one simply copies, involuntarily, any movement one happens to see. One child yawns, and then another; one coughs, then another. Voluntary imitation, on the other hand, selects and tries to imitate the copy, as in copying a drawing. This division corresponds, in the main, to the distinction between simple and persistent imitation. In simple imitation a child repeats some movement without modifying it in any respect. Usually he copies it only once, because he does not get interested in the act, and so is not stimulated to repetition. Such imitation has little educative value. In persistent imitation, however, he does find the copy interesting and is stimulated to repeat the movement again and again. As a typical case of this sort, Baldwin gives the illustration of his little daughter

Kinds of imitation

imitating him in taking the rubber of a pencil off and putting it on again. She would do this for half an hour at a time.

Value of repetition

Here we must note one point which will save much defective teaching if kept in mind. Are the children doing the same thing over and over in this repetition of the act? To us they appear to be, because they get the same result, but if we examine the acts more closely, we shall see that this is not the case. The first time Helen tries to put the rubber on the pencil, she probably does not succeed, although she tries very hard. She keeps on experimenting, making different movements with her fingers and the pencil, until she happens to get it on. Then she pulls it off and tries again; this time she succeeds more quickly and easily, because she leaves out many unnecessary movements. And so each time some movements are omitted and better control of the rest is obtained until the child is satisfied and stops. Each time the act is somewhat different from what it was before, and each time the child learns something. The entire process of repetition is the best method of self-education that could be devised, and should not be stopped.

The writer has been told many times that there are usually one or two songs or games which a child chooses to play ten times, where he chooses others once. Often we cannot see why he should like that particular song or game so well, but it would seem that it must exercise certain muscles and develop certain organs and so give a deep satisfaction to the child who chooses. His choice may not always be one that suits the majority of the children, however, and so he cannot always be gratified.

This enjoyment is also due in part to the great enlargement of a child's range of actions. When a child sees

a new movement and begins to imitate it, he finds a new self in his body that he has never dreamed of before. He gets a large number of new and delightful feelings, and, most glorious of all, he finds that he can get those feelings as often as he pleases by simply making a certain movement. He becomes master of himself through imitation, and the delight obtained from this beginning of control is the direct incentive to voluntary effort and to voluntary attention. Imitation is the developer of will power.

It is not the thing that is accomplished by the movement, but the feeling of the movement that delights the imitative child, and so he repeats it until he becomes thoroughly familiar with the feeling, and then discards that copy. So, also, he is satisfied with any makeshifts in his imitation if only they allow the right movements. Thus we find a little girl of three years washing her doll's clothes without water; ironing them with a cold iron; and mending them when there are no holes. Another papers the wall with imaginary paper and paste, using a clothes brush for a paste brush to help out his imagination.

Satisfaction in movement net result

Because all the child wants is the new feelings in the movements, we find also that æsthetic motives seem to have little value in deciding what children shall imitate. Repulsive things are as attractive as are beautiful. Children imitate deformities and disease. There are numerous cases of children impersonating lame people, humpbacks, blind people, or drunkards, not at all in a spirit of mockery, but just as they imitate everything else. To show how strong this copy may be, we have in mind a case of a little girl of five years who visited a sick cousin. For more than a week after coming home, she played she was sick. She made some bread pills, which she took regularly, and every little while

she would lie down, cover herself up, and act as her cousin had acted. It is rather difficult to know what to do in such cases, for we cannot prevent children seeing such things, and we do not wish to repress the spirit of imitation. Can we not make the children realize that the humpback suffers most of the time because his lungs, heart, etc., are pressed out of place by his curved spine? And that the drunkard is himself wretched, and the cause of wretchedness to others? That is, we should replace the superficial knowledge of the child by a deeper understanding, and he will lose his desire to imitate such things.

This leads us to another important characteristic of imitation,—its social nature. We have said that through imitation a child makes acquaintance with his own body and gets control of it; it is equally true that by imitation he makes acquaintance with objects and persons. When a child imitates the movements of another person he reproduces thereby in himself the same state of mind in part as that of the person whom he imitates. We have seen, in our study of the emotions, that if we assume a certain position, the corresponding emotion is likely to come, and this is also true when the movement is imitated. Our little copyist is able to put himself in another's place by imitation, and at first only by imitation. Imitation therefore is the basis of sympathy as well as the developer of will and attention, and the agency for giving us self-control. Truly, it hardly seems possible to exaggerate its importance in the mental development of any child.

Social value of imitation

Therefore let a child imitate freely, and do not fear that he will become a slave to outside influences. Rather, he is laying the foundations for future originality because he is gaining that knowledge of others and control of

himself without which no invention is possible. Imitation is the germ of the adventurer's spirit, from which in later life will bloom discovery, invention, and imagination.

The transformation from imitation to originality comes as his improvement in his imitation increases, until the original movement serves only as a hint for starting. The factor of imitation is, no doubt, still there, but is covered up more or less. This change comes, apparently, when the child has imitated until the act is easy, and hence requires so little attention that he can expend the mental energy thus set free in adorning the act, so to speak. Then imagination comes to the fore, and suggestion is invaluable. The place of imitation, accordingly, would seem to be in getting technique. It is a great advantage to a child who is drawing to see how to hold his pencil and how to make a clear line, and it certainly does not interfere with his individuality. The mistake that we all make lies here rather,— we insist upon giving him an *end* to copy that is outside himself, whereas the end should be the expression of his own personality, and should be chosen by himself. At the same time it is often true, no doubt, that a child does not know what he wants to do, or wants to do a thing that would harm him. In such cases suggestion must come in.

Relation to originality

We are very much afraid nowadays — at least many of us are — of destroying a child's spontaneity if he imitates much. There can be no doubt that children have been and are repressed far too much by school formalities, book study, and so on, but free imitation has nothing to do with such repression. Free imitation is as much a part of "free play"—the watchword of educational individualism—as is invention or imagination. Once more we would emphasize the fact that the development of a child proceeds best when he can freely choose what

he will do, but we would also emphasize the other fact of which we sometimes lose sight, that what a child thus freely chooses to do is almost invariably something that he sees going on in the life about him, and that the wisest educator is the one who so arranges the child's surroundings that the things to hold his attention for imitation are those which will best educate him. The child who persistently does not imitate is usually the incipient criminal. He is the unsocial child.

Importance of suggestion

Since the child of this age is so willing to take up in imitation whatever the teacher may suggest, the best kinds and modes of suggestion come up next for our consideration.

Suggestion is used here in the sense of any thought or act that may be acted upon by a person. Suggestion then takes many forms, which may be graded according to the degree of clearness in the idea suggested.

Physiological suggestion

At the bottom of the list Baldwin puts what he calls physiological suggestion. Examples of this are putting a baby to sleep by patting it, by singing to it, by putting out the light, learning to lie in bed when not asleep, and so on.

In such cases, an association is formed between a certain stimulus and a certain act, but the child has no clear idea of the act that follows, and it cannot properly be called imitative. The forming of associations here is, however, a very important matter, and one that is absolutely under the control of the one who has charge of the child, if the child is healthy. If a child is healthy it is simply folly for its mother to accustom it to constant attention and coddling in order to keep it good humored, or to put it to sleep. Most babies at first will go to sleep as readily if left alone in a quiet, dark room as if sung to sleep by a bright light. So with

all bodily habits, especially after six months. By regularly putting the child into certain positions, associations are formed between them and definite bodily reactions, and the reaction always follows. The extent to which this is true is shown in odd examples. I have heard of one little girl who could not go to sleep unless she saw a towel with a red border put under her pillow, and then she would drop off at once. Another had to embrace a certain book on theology.

Let us now turn our attention to other methods of offering suggestions and the advantages thus gained. That suggestion is strong among school children is shown in the experiments made by Mr. M. H. Small. He wished to see if he could not create real illusions by giving the children the right ideas. Accordingly he tested a school of five hundred children of all grades up to high school, in this way: he took into the room a bottle of perfume with a spray attached and also a perfumed card; he had two or three children come to the desk and smell of each. Then without the children knowing it, he substituted water for the perfume, and a scentless card for the perfumed one. He then sprayed the water into the room with every expression of enjoyment and was joined in these by practically the entire room. Seventy-three per cent of the children thought they could smell the perfume. He tried similar experiments with taste and sight, deceiving respectively 88 per cent and 76 per cent of the children. The deception was greater among the younger children than among the older.

Suggestion through ideas

Both before and since Small's experiments numerous similar ones have been carried out by Lippmann, Lobsien, Chomjakov, Kosog, Binet, Schnyder, Oppenheim, Ranschburg, and others, on children and adults, normal and

morbid. In some cases suggestions were made to falsify memory; in others, faint perceptions were used as in Small's tests. The *Aussage* tests, already referred to in the chapter on Memory, brought out this suggestibility in somewhat different ways, but Stern states that it lessens in the *Aussage* tests from 50 per cent at seven years to 20 per cent at eighteen years, and 25 per cent at fourteen years.

The percentages obtained from the various investigations differ somewhat according to the method of putting the question, but certain general statements may be made as to the results in which they agree.

1. Most subjects look upon a question as a command, whether they are adults or children, and endeavor to give some sort of answer, rarely refusing or saying that they do not know. This means that attention is focused on the question and its answer, and, consciousness being thus narrowed, the subject becomes more suggestible than before, and thus more easily impressed by the suggestions in any direction.

2. Binet's suggestive questionnaires showed that even when the questions were strongly suggestive of false answers, the subjects blamed themselves and not the questions, and that states of doubt were common. Choice between two incorrect dilemmas also succeeds much more often than suggestion of adding some small detail and, much more, some large detail. But here habit also plays a part.

3. Lippmann summarizes the effects of his experiments thus:

(*a*) The pure determinate question is the least suggestive.

(*b*) The yes-no and the complete disjunctive have little suggestiveness, and the false suggestion has little. The correct expectative question has more, and the questions

with false presuppositions and incomplete disjunctives have most of all.

4. But if the questions are put in series, we must remember that the *Einstellung*, or set of the subject's mind brought about by the previous questions, has a distinct influence, although we do not yet know how great this is.

5. And, finally, the knowledge which the subject already has and on the basis of which he answers, can be more easily modified along the lines of his habitual associations and his interests, and with regard to unimportant or small details than in other ways.

This tendency to accept and imitate the attitude of the teacher is due, as we have said, to the lack of conflicting ideas in the child's mind, and so the most essential thing in persuading is to prevent the rise of these. "A strong will," says Guyau, "tends to create a will in the same direction in others. What I see and think with sufficient energy, I make everybody else see and think. I can do this just in proportion as I believe and act my belief." The first essential for success in teaching, therefore, is enthusiasm and a conviction of the importance of the work. The next is belief in one's own power to succeed, for thereby one gains poise and the power to assert oneself calmly and authoritatively, both of which are necessary to the teacher.

Value of strong conviction

Beyond this, the teacher must make herself a model fit for imitation by the child. Her position of authority in the school fastens the child's attention upon her irresistibly for the time that he is with her, and imitation of her is as inevitable and unconscious as breathing. First of all, she must "sit up and look pleasant." She must carry herself well. It goes without saying that

Importance of good breeding in teacher

her dress must be neat, but it is equally important that it should be tasteful. A teacher who wears ugly colors or bad combinations of colors is a stumbling block to these little ones, in a very real sense, for she is training them to do the same thing. So also it is inexcusable for her to use harsh, shrill tones in speaking or singing. She must modulate her voice so that it will be low and sweet.

The degree to which all the physical peculiarities of one person are imitated by others is greater than is commonly appreciated. Coughs, stammering, hysterical attacks, carriage, peculiar gestures, and facial expression, all are imitated. The teacher who wears a worried frown soon has a frowning school.

Less observable but more important is the effect upon the child of the teacher's mental and moral attitude. Only from the standpoint of the power of suggestion do we appreciate the full importance of believing that a child is good, and of letting him know our belief. "Convince the child that he is capable of good and incapable of evil, in order to make him actually so." A child, and even an adult, unconsciously to a large extent, imitates the copy of himself that is held before him. Suppose a child has misbehaved in some way. With a little child, the chances are that his intention was not wholly bad, and if we assume that he was mistaken in his act and not willful, we can often change the intention. Say, "Now see how others would misunderstand you, though you did not really intend to do wrong," or "See how you have hurt him, but you did not mean to," and so on. The little recreant will find it harder *not* to live up to this copy than to imitate it, as a general rule. So, generally, when the selfish or narrow side of

Value of belief in child

a child's nature comes to the front in an act, do not make it definite and clear cut to his consciousness by talking to him about it, but rather emphasize first its unhappy results, and then the good results which rise from another way of acting. Make the child conscious of the good tendencies but not the bad, unless he is evidently doing wrong with full consciousness of it. Then remonstrance and discussion are in place, as we have already said.

Every movement of the teacher is a suggestion to the pupil. If she expects bad behavior, she calls it out by her attitude of suspicion. Her eyes, head, hands, all declare her expectation, and give rise to ideas of mischief that otherwise would not enter the child's mind. In the same way, we find that children usually care most for the subject that the teacher likes. When she loves nature and the beautiful, every suggestion is of their attractions, and she can carry the pupils over numberless obstacles by reason of their imitation of her enthusiasm. Her own feelings, with their concomitant actions, are reflected in her pupils. Such things are "catching."

We see here also why a negative suggestion is less valuable than a positive one. If I say, "Johnny, don't put the beans in your nose," why is it less valuable than to say, "Johnny, put the beans in your pocket"? Evidently, in the first case, Johnny's attention is fastened on the beans and nose, and he is at the same time left inactive. The natural thing is for him to act on the idea presented. In the second case, his attention is fastened on a useful idea, and he is given something to do. The different methods of treating a child who gets hurt are in the same line. Why is it better to make light of the injury?

Negative suggestion bad

Evidently because this gives the child a good copy to imitate.

In its wider bearings we can only refer to the possibilities in imitation and suggestion. Social contagions both good and bad have been studied and their laws formulated. At the other extreme, the power of auto-suggestion has been emphasized, perhaps overmuch. The use of suggestion in the cure of disease and the reformation of morals has been extolled, and along with the bad much good has been done.

The still broader question of why we choose certain acts and qualities for imitation goes back doubtless to the question of interests and instinctive tendencies. There are many more things that a child does not imitate than that he does, but with regard to the things chosen imitation is assuredly the master method of acquiring the desired qualities.

REFERENCES

Bacon, John. Thoughts on Imitation. *Paid.*, 1902, 4, 100-104; 160-163.

Baldwin, J. M. *Mental Development in the Child and the Race.* Macmillan, N. Y., 1906, 3d ed., 496 pp.

Mental Development: Social and Ethical Interpretations. Macmillan, N. Y., 1897, 574 pp.

Mental Development: Methods and Processes. Macmillan, N. Y. and London, 1895.

Suggestion in Infancy. *Science.* 1891, O. S., Vol. XVII, 113-117.

Barrows, C. M. Suggestion without Hypnotism. *Proc. of the Society for Psychical Research*, 1896, Vol. XII, 31-44.

Bell, J. C. Effect of Suggestion upon Reproduction of Triangles. *Am. Jour. Psy.*, 1908, 504-518.

Bosanquet, B. Imitation. *Mind*, N. S., 1899, 167-175; *Psy. Rev.*, 1902, Vol. IX, 383-389; answer by Baldwin, 597-603.

Brand, J. E. Effect of Verbal Suggestion upon the Estimation of Linear Magnitudes. *Psy. Rev.*, Jan. 1905, 41-49.

Chancellor, W. E. *Class Teaching and Management.* Harper, 1910, 342 pp. *See* Index.

Deahl, J. N. *Imitation in Education.* Macmillan, N. Y., 1900, 99 pp.

Dubois, Paul. *Influence of Mind on Body.* Funk and Wagnalls Co., N. Y., 1906, 63 pp.

Self-Control. Funk and Wagnalls Co., N. Y., 1909, 337 pp.

Psychic Treatment of Nervous Disorders. Funk and Wagnalls Co., 1905, 466 pp.

Edgar, J. Individuality and Imitation in Children. *Child Study,* Lond., Apr. 1908, Vol. I, No. 1, 12-23.

Ellwood, C. A. Theory of Imitation. *Am. Jour. Soc.,* 1901, Vol. VI, 721-741.

Frear, Caroline. Imitation. *Ped. Sem.,* Apr. 1897, Vol. IV, 382-386.

Gross, Karl. *The Play of Animals.* Appleton, N. Y., 1898, 341 pp.

The Play of Man. Appleton, N. Y., 1901, 412 pp.

Guyau, J. M. *Education and Heredity: A Study in Sociology.* Scribner's, N Y., 1891, 240 pp.

Harris, W. T., *et al. Psychological Foundations of Education.* 295-321.

Psychological Tendencies. The Study of Imitation. *Rept. U. S. Com. Ed.,* 1896-7, 671-694.

Haskell, E. M. Imitation in Children. *Ped. Sem.,* Oct. 1894, Vol. III, 30-47.

Hays, H. M. Hypnotism, its History, Nature, and Use. *Pop. Sc. Mo.,* Nov. 1905, Vol. LXVII, 590-607.

Holman, H. Imitation in School Children. *Paid.,* Apr. 1889, 24-37.

Huntington F. D. Unconscious Tuition. *Am. Jour. Ed.,* 1856, No. 1, 141-163.

Imitation, Report of Commissioner of Education on, 1896-7, 671. (Summary of Tarde, Royce, and others.)

James, Wm. *Varieties of Religious Experience.* Longmans, N. Y., 1904, 534 pp.

Talks to Teachers. Holt and Co., N. Y., 1899, 301 pp.

Keating, M. W. Suggestion in Education. A. and C. Black, London, 1907, 202 pp.

Le Bon, G. *The Crowd.* Macmillan, N. Y. $1.50. (Shows the power of suggestion.)

Ledyard, Mary F. Imitation, Originality and Freedom. *Proc. N. E. A.*, 1899, 547-551.

Lippmann, O. Die Wirkung von Suggestivfragen. *Zeit. f. ang. Psy.*, 1907-9. (Series of articles; among the best.)

Lukens, H. Suggestion in the Cure of Faults. *N. W. Mo.*, May 1898, 592-595.

Moll, Albert. *Hypnotism.* Scribner's, New York, 1906, Vol. XIV, 448 pp.

Newbold, W. R. Suggestibility, Automatism and Kindred Phenomena. *Pop. Sc. Mo.*, 1895, Vol. XLVIII, 193-198; 375-380; 520-526; 641-652.

Interpretation of Automatisms. *Pop. Sc. Mo.*, 1897.

Noble, E. Suggestion as a Factor in Social Progress. *Int. Jour. Ethics*, 1898, 214-228. (The great necessity of suggestions of good.)

Pearce, H. J. Experimental Observations upon Normal Suggestibility. U. of Chicago Lab. *Psy. Rev.*, 1902, Vol. VIII, 329 *et seq.*

Preyer, W. *Senses and Will.* Chapter on Imitative Movements. Appleton, N. Y. $1.50.

Riddell, M. N. *Child Culture . . . and Mental Suggestion.* Chicago, 1902, 129 pp.

Royce, J. Imitative Functions. *Century*, Vol. XLVIII, and *Psy. Rev.*, Vol. II.

Seashore, C. E. Measurements of Illusions and Hallucinations in Normal Life. *Yale Psy. Lab. Studies*, Vol. III, 1895, 1-67.

Review of Binet's *La suggestibilité. Psy. Rev.*, Nov. 1901, Vol. VIII, 610-616.

Sidis, Boris. *Psychology of Suggestion.* Appleton, N. Y., 1898, 386 pp.

Small, M. H. The Suggestibility of Children. *Ped. Sem.*, Dec. 1896, 176-220.

Steel, R. *Imitation.* Simpkins and Marshall, Lond., 1901, 197 pp.

Sudborough. What Children Imitate. *N. W. Mo.*, Vol. VIII, 99, 136, 162, 226, 300, 332.

Tarde, Gabriel. Inter-Sociology. The Interplay of Human Minds. *Int. Quar.*, 1903, Vol. VII, 59-84.

The Laws of Imitation. Holt and Co., N. Y., 1903, 404 pp.

Trotter, W. Sociological Application of the Psychology of the Herd Instinct. *Soc. Rev.*, 1909, Vol. II, 36-54.

Tuke, Hack. *Dict. of Psy. Med.*, Imitation, Vol. VI, 676-678. Blakiston, Phila. $10.00.

Urban, W. M. Psychology of Sufficient Reason. *Psy. Rev.*, July 1897, 361-373. (Bases all knowledge upon the feeling of reality obtained from more or less perfect imitation.)

Van Liew, C. C. Educational Bearings of the Principle of Imitation. *N. W. Mo.*, Vol. VII, 320-327.

Waldo, Bell. Imitation in Children. *C. S. M.*, Vol. II, 75-78. (Principally examples.)

Waldstein, Louis. *Subconscious Self and Its Relation to Education and Health*, 41-80, 160-162. Scribner's, N. Y. $1.25.

Washburn, M. F. Recent Discussions of Imitation. *Phil. Rev.*, 1899, Vol. VIII, 101-104. (Discussion of Tarde and Baldwin.)

Wellman, F. L. *The Art of Cross Examination.* Macmillan, 1905, 404 pp. *See* Index.

Wundt, W. *Human and Animal Psychology.* Chapter on Hypnotism and Suggestion, 328-339. Macmillan, N. Y. $2.60.

CHAPTER XVII

LANGUAGE

Observations

1. Keep a dated record of the order of development of vowels and consonants; of "clicks," grunts, and other sounds.

2. Note when gestures begin to be used to get what the child wants. What gestures are used by the child? What are first used? What are most frequently used?

3. Note when the baby begins to understand speech. Be careful here not to confuse knowledge of the word with knowledge of the gestures. To be sure that the baby understands the word, it must be spoken without gestures or any unusual inflections.

(1) When does he know his name?

(2) The names of the people that he sees most frequently?

(3) The names of any objects?

4. The beginnings of speech. Keep a record of the first words used with meaning, spelling them as they are pronounced and classifying them as they are used, not as classified in a grammar.

Such a record can be made for children of any age.

5. Keep a record of the color vocabulary from the time when the child first names a color correctly.

6. Keep a record of the first sentences, noting the order of the words.

7. Collect accounts of words and languages invented by children.

One of the characteristics of man that has attracted much attention and been the cause of much discussion is his ability to use language, that is, to communicate with others. In this, its most general sense, language is not limited to words, but also includes gesture, drawing, which originated in gesture and whence written language was derived, and any cry that has meaning, whether it be articulate or merely the cry of rage or pain.

Instinctive expressive gestures

Within a week after his son's birth, Preyer noted the turning away of the head when the baby had sufficient food. This is the forerunner of the shake of the head in denial. In the sixth month, arm movements were added to this, which looked like pushing away the object, but they did not clearly have that purpose until the fifteenth month, and then were probably imitated.

In the first turning away of the head, the movement is expressive of the fact that the baby has had all that he wants, but of course he has no intention of communicating with others by the movement. The movement is as instinctive as sucking itself, and is important here only because later it is used as a sign by which to express thought.

During the first months of life there are a number of instinctive movements which are also expressive and which are the basis for later gestures and words. Among them are the instinctive expressions of pain, weariness, fear, anger, astonishment, joy, desire, and pride. These are not all present at birth, but appear before the end of the first half year.

The first tears, which may express weariness, pain, fear, or anger, appear between the twenty-third day and the twentieth week. The characteristic transverse wrinkling of the forehead in grief, appears early and

also the peculiar parallelogram-shaped mouth, and putting up the lip.

The first smile sometimes comes even in the second week, but is likely then to be only an impulsive grimace and not expressive of satisfaction. By the end of the first month Preyer found that it was always associated with comfortable conditions, and in a few months arm movements regularly aecompanied it. Darwin puts the first smile as late as the seventh week, and the first laugh in the seventeenth week. Preyer puts the first laugh at nearly the same date as the first smile. Later the laugh also is accompanied by arm movements. It became much more noticeable in his son in the eighth month, and then was at times imitative. Laughter passing into tears, he never observed in children less than four years old.

The characteristic look of astonishment appeared in Miss Shinn's niece in the sixth week, on tasting some new food. This also is hereditary, and one of its important factors, the horizontal wrinkles of the forehead with wider opening of the eyes, is traced back by Darwin to the attempt to see better the object causing the surprise.

Fits of rage or anger, with stiffening of the body, and striking out and kicking, appeared as early as the tenth month in Preyer's boy.

Desire is very early shown in the cry, and to this is added, about the fourth month, the stretching out of the arms to the thing wanted; and still later, the putting of the hands together as if to grasp the object. Between the eighth and twelfth months, pointing is gradually developed from this.

Expressions of affection, such as kisses, pats, and hugs, are imitated, and do not appear until about the

sixth month, at which time also a real gesture language is likely to begin.

Gesture, or the sign language, is common to all men and is used by animals almost as much as the inarticulate cry. It seems to be of almost as wide application as the cry. The dog's entire body is unconsciously eloquent of his mood, and even consciously he makes a limited use of gestures in trying to attract attention or to persuade man to do his wish. When we come to man, we find that the natural sign language is strikingly similar in all parts of the earth. An Indian can make himself understood anywhere that the sign language is commonly used. Deaf-mutes who have not been taught the conventional sign language, and Indians understand each other without difficulty.

Voluntary gesture

We can hardly question that gesture, aided by a few half-articulate cries, was the first language, and for a long time was more prominent than speech in men's communications. So we should expect to find, as we do, that in each baby's development gestures come to have significance before words do.

At about the same time that imitation begins, significant gestures arise. The six-months-old child tugs at his mother's dress when he is hungry, holds out his arms to be taken up, and learns to wave "bye-bye" and go through the various baby tricks. A little later he begins to invent gestures. All kinds of begging and coaxing gestures, attempts to attract attention, appear.

The use of nodding to mean "yes" is not seen until between the twelfth and fifteenth months, and is probably not hereditary, as shaking the head is, although Miss Lombroso so classes it. It does not appear until long after shaking the head does, and is probably imitative.

In this use of gestures the baby is at one with primitive man, uncivilized peoples of to-day, deaf-mutes, and aphasic patients. There seem to be certain common or root gestures which all men who have no speech, or only imperfect speech, use in expressing their thoughts, and it seems as though reference to this natural language might settle some of the disputes as to the appropriate gestures in discourse.

Gestures the primitive language

On the other hand, there are variations from these common roots according to the nationality and rationality of the person, just as there seem to be variations even in the instinctive expressions of emotion, so that we cannot press too far the theory of a universal sign language. Savages and children use many more gestures than adults of civilized races, and more pronounced inflections. It is related of some savage tribes that they can hardly understand each other in the dark.

Such language is much more closely confined to the concrete than are words. The gesture is essentially a reproduction of the object or action, and does not lend itself readily to the representation of class-ideas or trains of reasoning. Uninstructed deaf-mutes, it is claimed, have few ideas of the supernatural, and only the lowest abstract ideas. The entire system of gesture, while pleasing and universal, soon reaches its limit of development and must give way to a system that has greater mobility and power of adaptation.

It is supposed that there is some connection between the sign language and the spoken word, but we have no exact knowledge of what it is. The brain centers for control of speech and of the right hand are close to each other, and presumably the exercise of either would stimulate the other through diffusion of the nervous excitement.

Connection of gesture with words

Considering language merely as a means of communication, there would seem to be nothing marvelous in the fact that the word has come to be its chief form. It is simply a case of the survival of the fittest. Not only are the lips and tongue more mobile than other muscles, and so better adapted for expressing slight differences of sound and thus for indicating many objects with comparatively small effort, but their use leaves the hands free to do other work at the same time that talk is going on. It would seem inevitable, therefore, that the word should become the especial means of communication as the demand for communication grew, though at first it was carried on merely by inarticulate cries and gestures.

Speech and the cry

Cries and gestures seem to be to a large extent common to all men, and also to men and animals. The cry of rage is easily distinguished from that of pleasure, the cry of fear from that of attack. When we go beyond these, however, we approach speech. Buckman is authority for the statement that fowls have twelve or more different cries by which they warn and guide each other; cats, six; rooks, six, and monkeys two hundred or more, almost a language itself. We find also that many animals can learn to understand us, no gesture or peculiar inflection being used. Romanes quotes the case of a chimpanzee who would follow her master's directions into minute details about sticking a straw into the meshes of her cage. Dogs also learn to follow directions. It is related of one of Scott's dogs that the servants used to trick him by saying in his presence that the master would come home over the hill. The dog would at once go the route indicated, never by any chance taking the other path. There seems to be no intrinsic reason for doubting the possibility of such things.

This does not, of course, mean that animals can reason.

In all such cases it is difficult to separate tone and inflection from the mere sound of the word. The former are the more primitive. Most animals obey the tone rather than the word. Idiots who cannot learn to speak or understand words can be taught some things by tone and gesture. This, perhaps, is one reason why music—mere tone—has such a universal hold.

From these rudimentary cries which man possesses in common with animals, some philologists believe that human speech has developed through refinement of the articulation. The reflex cry of emotion, the voluntary cry of warning or threat, and the imitation of some sounds, thinks Le Fèvre, furnish the elements of language. Of these elements animals possessed the first as well as man, but man, with a more developed brain, distinguished and used more words, through changes in intonation and in sounds. Other philologists lay more stress upon the influence of sex in developing language; while still others believe that man speaks primarily because his lips and tongue are more mobilé than those of animals.

Development of human speech

Whichever factor may have been the leading one in the race-origin of language, we can see that in the baby's speech they all play some part.

It is indubitable that man now has a certain instinct to speak—to communicate by sounds—though not to speak any given language. It seems that a French child brought up in an English family, or vice versa, learns the adopted tongue as readily as the natives do. How far the development of language would go if children were left entirely alone is an interesting but unsettled point. The cases of shipwrecked children are unsatisfactory, because such children have had no companions

and so no incentive to invent a language. Long before a child imitates, however, he babbles, and the sounds that he thus instinctively makes are his unconscious preparation for later speech.

The child enters life with a cry, which has been the subject of much discussion. Some claim that it is a celestial cry — apparently a reminiscence of the angel's song. So noted a man as Kant asserts that it is a cry of wrath at being introduced to the hard conditions of this life. But we will satisfy ourselves with the notion that it is simply a cry of pain when the cold air rushes into the lungs and automatically expands them.

The first cries

The first cries are instinctive and to the child's own mind are not expressive, although they usually indicate bodily conditions, such as hunger or pain or pleasure. Preyer notes the wail of hunger, the sharper loud cry of anger, the crow of delight, the monotonous cry of sleepiness, and the short, high-pitched yell of pain. These are instinctive at first and are not intended to tell others what his condition is.

The child cries at a bright light or a bitter taste, and later at a loud sound, because there are certain arrangements of nerve cells at birth that necessitate this response. During the first month of life the sounds that the child makes are for the most part vowels; *â*, *o͞o*, *ă*, are the favorite ones, and there are variations of these and others which adults find it difficult to describe. These sounds are also frequently given on an inspiration and expiration, making two-syllabled combinations like *agoo*.

The first consonant put with them is an indistinct guttural or nasal, *g* or *ngâ*, as Miss Shinn gives it. These syllables are repeated by the baby again and again, making reduplications, for which he has a fondness for

some time after real speech has begun. Savage races show the same fondness.

Wallace and Johnston have also attempted to show that the order of development in baby speech, from vowels to semi-vowels, nasals, and consonants, parallels the development of human speech.

The first consonants that appear are *m*, *p*, *d*, *l*, and *k*. The first sound not a vowel was heard by Preyer on the forty-third day; the first *ma*, on the sixty-fourth day. On these facts Buckman has based an ingenious theory as to the origin of language. The combination *ma-ma-ma* is usually the first. Vierordt states that generally the vowel in the crow of pleasure is *a*; of pain, *ä*. The latter very naturally, says Buckman, although purely reflex at the start, is used when the child is hungry or in pain, and becomes a way of calling for his mother, who relieves hunger and pain. Hence it becomes her name, "*mama*," and this root is found in Sanskrit, Greek, and Latin, as well as in our modern languages.

First sounds

So again, *pa* or *da*, resulting in "papa" or "dada" is a natural cry when the child is not as violently agitated as by hunger, and becomes attached to the father. This root also is found in Sanskrit, Greek, and Latin. *Kah*, on the other hand, is used to express strong disgust, as when the child tries to eject disgusting food. It is made by lifting the lips from the teeth, opening the mouth and almost coughing, the same instinctive expressions that animals employ. From it come the Greek κακός (*bad*), κάκκη (*excrement*), Latin *caco*, and similar words.

The *la* sound, on the other hand, is given in contentment, or pleasure, and gives rise to the Greek λαλέω, (*to chatter*), and the English *lullaby*.

From these instinctive utterances language first arose,

thinks Buckman, constantly growing in fineness until the marvelous complexity that we now use was attained. Taine and Darwin bear out these remarks as to the first sounds. With Taine's daughter *ma* was first given; *krauu* to express disgust, and *pa* a little later.

Miss Shinn's records agree with these as to "mama." "Dada" was also one of the first words, and signified pointing out, seeing, exulting, admiring. "Nana" was a wail of protest and refusal. Two other words, "kraa" and "ng-gng" or "mgm," were used very early but were imitations of words given to her to express disgust, and disappearance.

The first exercise of the organs is not expressive of any meaning. The baby enjoys exercising his throat, tongue, and lips and so keeps it up for hours at a time. It is an excellent training for the later speech, for, although he can as yet *imitate* no sounds, he *makes* all the sounds and gets flexibility and strength of the vocal organs and lungs. Deaf-mutes, who make few sounds as compared with normal children, are unusually subject to throat and lung diseases.

Order of sounds and syllables

The exact order in which the various sounds appear must vary, although in the main the same, because the shape of the mouth and the other vocal organs differs and the child pronounces first the easiest vowels and consonants. It is also noticeable that Preyer says that during the first year of life the child pronounces all the consonants, even those which later on he has to learn over again. We have here a fact similar to what we have already noticed in imitation, when the child involuntarily does easily and well what he does slowly and imperfectly when the action is voluntary.

Among the sounds made at this early stage are all

sorts of gutturals and "clicks," which adults find it difficult to speak and which correspond closely to Arabic and Hebrew gutturals and savage "clicks."

The order for the appearance of the letters, as given by Tracy, is as follows, beginning with the most difficult: *r, l, th, v, sh, y, g, ch, s, e, f, t, n, q, d, k, o, w, a, h, m, p, b.*

Sully puts all mistakes in pronunciation under the following heads:

1. *Simplifications.*

(1) A child naturally drops letters and syllables that are hard for him, especially if they are at the end of the word, and the inflection and rhythm are not altered thereby. At first he seems to understand only the vowel sounds in what is said to him, and in imitating a sound will get only the vowel and inflection, with a vague surrounding of indistinct consonants. Preyer's boy would respond in the same way to "Wie gross?" "gross," and "o'ss." Again, in trying to say "Putting my arms over my head," little Ruth would get, "ŭ ĭ ĭ ă ōwў ĭ ĕad," with hardly a distinct consonant in it, but a ludicrously faithful reproduction of my own tones.

Mispronunciation

In this dropping of syllables *dance* becomes "da"; *candle*, "ka;" *handkerchief*, "hanky," "hankish," or "hamfish," and so on.

(2) The accented syllable naturally is always the one kept, whether it is at the beginning, middle, or end of the word, for we speak it with more stress and voice, and it must attract the baby's notice more than the others.

2. *Change of letters.*

(1) Vowels are not omitted but are often changed.

(2) Consonants are not always dropped, but others

may be substituted for them when they are difficult. In such cases the preceding or succeeding sound determines what shall be put in, giving a duplication. Thus "cawkee," *coffee*; "kork," *fork*; "hawhy," *horsie*; "laly," *lady*. In other cases *p* and *s* are dropped and others substituted: "feepy," *sleepy*. Where *l* and *r* are replaced, almost any substitute may be used, but *w* is a favorite.

(3) The consonants may be interchanged: "tsar," *star*; "psoon," *spoon*; "hwgohur," *sugar*; "aks," *ask*; "lots it," *lost it*.

With all these natural difficulties in speaking correctly, it seems a pity to add further mispronunciations by his elders, in the form of baby talk. Baby talk is one form of endearing terms, but surely the English language has a vocabulary of such words that is far better than the usual run of baby words. We hinder the child's speech by limiting ourselves to him. We should rather encourage him to use our words, especially as the vocal organs grow less flexible as they become more used to certain combinations of sounds, and so an incorrect pronunciation may become habitual. An older form of baby talk is found in many school books in the names given to flowers, animals, geometrical figures, and so on. As a matter of fact, children learn the correct names as easily as they do the silly, sentimental names, and do not need to unlearn them later.

Baby talk

So far we have discussed only the making of articulate sounds. We have not yet reached language. For language we must have not only a perfect vocal and auditory apparatus, but ideas, and desire to express them. During the first six months the child seems to lack these, although Darwin noticed in his boy different cries for hunger and pain at the age of eleven weeks and an incipient laugh in the sixteenth

Rise of true speech

week. But it may be questioned whether these were not entirely involuntary and reflex. In the second six months, however, persistent imitation of sound and gesture arises. The child voluntarily uses different cries and gestures for different things, although his vocabulary of spoken words is very small, or may indeed be nil, as in the case of Taine's child.

Feldman, on comparing children, found that the first word varied as follows:

Month:	14	15	16	17	18	19
No. of children:	1	8	19	3	1	1

These children first walked alone:

Month:	8-9	10	11-12
No. of children:	3	24	6

We have already seen that Mead's study of normal children show that the median age for the first step is 13.54 months, and for the first word, 15.8 months; for abnormal, the median for the first step is 21.6 months, and the first word, 34.4 months.

From this it appears that children walk before they talk, and we may add that they understand before they walk.

The first vocabulary

When the child is learning to walk he acquires no more speech and may even go backward, but after that the learning and understanding of words is very rapid. A child understands many words before he speaks, even as early as eight months. Strümpell's daughter enjoyed little stories told her in her thirteenth month, though her own speech was very imperfect. Another child of eight months knew by name all the persons in the house, the parts of her body, and most of the objects in the room, and understood simple sentences.

It should be said here that children may differ within

wide limits as to the time when they begin to speak, and still not be abnormal. Perez, indeed, says that "The more intelligent a child is, the less he uses words, and the more necessary it is to him that words should signify something to him, if he is to learn them; and this is why he only learns words in proportion as he gains ideas about objects."

The character of the first vocabulary is shown in the following comparative table, which is given in per cents:

	Noun	Pron.	Verb	Adj.	Adv.	Prep.	Conj.	Interj.	Total No. of Words
Dewey.									
1 girl, 18 mos....	53	6	28	1	6	0	1	6	144
1 boy, 19 " ...	60	0	21	11	3	0	0	5	115
Tracy.									
12 children, 19 to 30 mos.....	60	2	20	9	5	2	.3	1.7	5400
Salisbury.									
1 girl, 33 mos....	54.5	3.7	23	9.6	5	3	.006	.006	642
1 girl, 5½ yrs.....	57	1	20	17	2	1	.003	.0009	1528
Wolff.									
Boy's Dictionary[1]	42	0	30	8	10	4			215
Kirkpatrick.									
Per cents of words in English language.....	60		11	22	5.5				

These lists, as Dewey remarks, classify the words according to their meaning for adults, an artificial method for two reasons. At first one word stands for a sentence in childish speech. "Water"—*I want water.* "All gone"—*The flower has disappeared,* etc. Furthermore, the child, like the savage, uses one word for many parts of speech. "The hurt blooded." "It ups its false feet."

[1] This dictionary was made by a boy before his seventh year. It does not, of course, give his entire vocabulary, but only words that for any reason he wished to define.

"Can I be sorried?" etc. A carefully made vocabulary would classify each word according to the child's use of it, and so such classifications as these given here are but rough and ready tests. Even so, however, they are suggestive of characteristic differences between the child and the man.

The idea of *action* is very prominent in all the first language. Even with this artificial classification, the percentage of verbs is twice as large in childish as in adult speech, and less than 1 per cent of the nouns are abstract. Here again we find the parallel between the child and the race. The more primitive a language, the larger the proportion of verbs, and it is very probable that the first sentences consisted of but one word. An interesting bit of evidence to show how recently the different parts of speech have assumed clearness in man's mind is the fact that the ancient Greeks, in writing, ran all the words of a sentence together

Color vocabulary

Children vary greatly in the age at which they learn to name colors, as well as in the ability to distinguish the colors. Preyer's child at twenty months knew no color names. This seems to be more a matter of opportunity than of inability to discriminate. Sanford and Wolff say that the average educated adult uses only twenty-five color terms. Many five-year-old children use only five, and the average two-year-old but one. Pelsma's child, however, who often saw her mother painting, used five at twenty-four months; eleven at thirty-six, and eighteen at forty-eight months. But Pelsma does not attribute this large number to any unusual sensitiveness to color.

The number of different words, as well as the classification of them, varies greatly from writer to writer. Whipple and Tracy, for instance, class each inflection,

except plurals, as a separate word, believing that to the child they are distinct ideas. Others do the opposite. Most classify the words according to the child's use of them, but this introduces an element of uncertainty, a large personal factor, into the classification. We now have, however, more than a hundred vocabularies, and are able to outline the general course of development. The following table, taken from J. R. Pelsma's Summary of Children's Vocabularisc (*Ped. Sem.* Sept. 1910, p. 347) summarizes the results. The twenty-six children of the first four rows are different from the sixty-eight of the next two.

Yr.	No. Ch.	Total No. Words	Noun		Verb		Adj.		Adv.		Pro.		Prep.		Conj.		Int.	
			Words	%	Words	%	Words	%	Words	%	Words	%	Words	%	Words	%	Words	%
1	6	68	51	75	5	7.4	4	5.8										
2	15	7658	4461	58.3	1588	20.7	798	10.4	366	4.8	150	2.1	115	1.5	20	0.3	151	1.9
3	3	3628	2074	57.4	776	21.5	417	11.3	173	4.8	80	2.2	51	1.3	16	0.4	42	1.1
4	2	2298	1308	56.9	476	20.7	260	11.3	137	6.0	44	1.9	23	1.0	17	0.7	33	1.5
0-2	50	10890	6707	61.5	2063	19.0	1043	9.6	483	4.5	187	1.8	136	1.3	26	0.2	241	2.1
2-4	18	14403	8312	57.9	3023	21.0	1551	10.7	759	5.3	301	2.1	209	1.4	71	0.4	177	1.2
0-4	68	25293	15019	59.4	5086	20.1	2594	10.3	1242	4.9	488	1.9	345	1.3	97	0.4	418	1.7

The range in the number of words as given by various observers is large. Thus at twelve months seven cases range from 3 to 24 words; at eighteen months, four cases range from 60 to 144 words; at two years, nineteen cases varied from 36 to 1,227 words; at thirty months, five cases varied from 327 to 1,509 words. Pelsma's table for fourteen two-year-old children gives an average of 518 words, and for three years, 1,209, but he believes both these above the average, which he puts at 1,149 for three years, and about 2,000 for six years, though he does not state his grounds in either case. He excludes inflected endings and grammatical variants from his lists, and thus makes the numbers somewhat smaller than some observers. But Mead's fifty children

Range in vocabularies

did not begin to talk until 15.8 months. (See chapter on Reflex and Instinctive Movements.)

It happens also that children living under ordinary conditions sometimes invent words and even languages, The languages we shall mention later. The words seem, in some cases, not to be the result of imitation, but strictly original. Among such cases are "memby," *food*; "afta," *drinking*; "gollah," *rolling things*; "tonies," *children*; "diddle-iddle," *hole*; "wusky," *sea*.

Invention of words

One child described by Mr. Hale invented names in which the vowels denoted the size of the object as they were higher or lower; for example, "lakail," *an ordinary chair*; "lukull," *great armchair*; and "likill," *little doll's chair*; "mem," *watch* or *plate*; "mum," *large dish*; "mim," *moon*; and "mim-mim," *stars*. Deaf-mutes invent a few words usually, and some invent many. Words for food and drink are the most common. Hall has a selected list of more than a hundred words invented by children which seem to exclude imitation.

Besides the invention of words, children usually form some words through the imitation of sounds or onomatopœia, as Miss Shinn's niece imitated the mewing of a cat and later used the sound for the cat's name. In this respect, as well as in the invention of words, the natural tendency is repressed by the fact that children have the adult language before them to imitate, and so are saved the trouble of inventing a new one.

Nevertheless, the tendencies which do crop out are of great interest to the philologist, because the words which children form either through invention or imitation show curious resemblances to primitive tongues and offer suggestions as to the origin and development of language. For instance, Mr. Hale and various other

authorities who have studied the words and languages invented by children, believe that in this tendency to invent is seen the cause of the origin of diverse languages. "Each linguistic stock must have originated in a single household. There was an Aryan family-pair, a Semitic family-pair, an Algonkin family-pair. And further, it is clear that the members of each family-pair began to speak together in childhood."

The first sentence

The age at which the first sentence is spoken will vary as much as all other stages of language development. To quote Preyer again, his son spoke the first sentence near the end of the twenty-third month. The memorable utterance was "Heim mune," which, being translated is, "Home, milk." Strümpell's daughter, however, spoke her first word in the tenth month and used sentences as early as the seventeenth month. Trettien makes the average from eighteen to twenty months. Pelsma says that at two years his daughter used all parts of speech, and compound and complex sentences.

The first sentences after the sentence-words already mentioned commonly consist of a noun and adverb or adjective, or two nouns with a verb understood. "Big bird," "Papa, cracker, milk," etc. The verb makes its appearance, says Sully, as an imperative first. The order of the words varies, sometimes subject and sometimes predicate being put first. Apparently imitation has little effect when an English child will utter a sentence like this: "Out pull baby spectacles." I suppose that the order depends upon the idea which is most prominent in the child's mind, that being put first, as with adults sometimes, for the sake of emphasis. Children as a rule seem to have trouble in putting "not" in the right place; and they also bring out their meaning by making two

opposing statements—"This not a nasty wow wow; this a nice wow wow." This uncertainty of order is also paralleled in primitive languages.

First use of inflections

We all know the wonderful things a child does, when he tries to use inflections, in his attempt to make the language consistent with itself. Of course irregular verbs are made regular, plurals are all formed alike, and so on, but he caps the climax in his use of the verb *be*. As Sully says, it is asking too much of a child to expect him to say "Yes, I *am*," when asked, "*Are* you good now?" and we can sympathize with the little girl who, after much drill from her mother, when asked if she was going out said, "I'm are." If a child is asked, "Will you be good?" why should he not say, "I be good"; or, if that event occurred yesterday, "I bĕd good"? "Am't I?" is surely as logical as "Is n't he?" We find also an impromptu making of verbs that is delightful. "Better n't you do it?" says the little fellow.

"I" and "you" are stumbling blocks also. At first the child speaks of himself by name, and is likely to think "I" and "you" names like any other. So he will say, "What am I going to do?" for "What are you going to do?" The constant change from one to the other, according to which person is speaking, is most puzzling, and yet Tracy says the child has learned the meaning by twenty-four months. Others assign dates from sixteen to thirty months, a wide variation. This is, of course, a gradual process. The child will use the terms correctly, and then drop them for a time, to resume them later. The free use of them is commonly taken to signify more sense of the child's own personality than before. The development of speech is effectively summarized in the chart found on the following page.

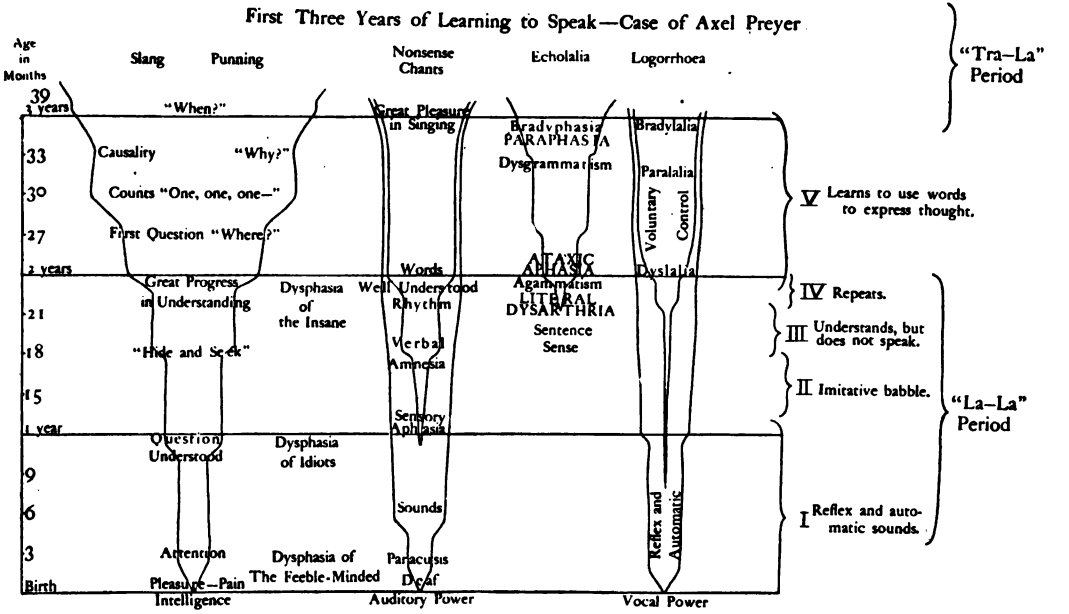


DIAGRAM 10. LUKEN'S SUMMARY OF PREYER'S OBSERVATIONS ON THE ACQUISITION OF SPEECH AND ITS PARALLELISM WITH THE LOSS OF SPEECH THROUGH DISEASE. (Used by permission of the *Pedagogical Seminary*.)

Language and thought

After the child by his instinctive babblings and persistent imitation has learned to speak words, he learns to use them with a significance from constantly hearing one word used in connection with a given object. In so far as the same word is used for different objects or situations, he is left helplessly struggling for the common meaning hidden beneath all this diversity; and again, when different words are used with the same meaning, as in the various forms of *be*, he is led astray into seeking differences where none exist.

Hence comes the value of language as an aid in the development of concepts, and as a revealer to us of their growth in the child's mind. At first he uses words in altogether too wide a sense. "Mamma," "bath," "wow-wow," are applied not only to the particular objects he knows, but to all that in any degree resemble them. The child does not see differences distinctly enough to mark off individuals unless there is some striking characteristic to aid him. He rather associates the word with the whole situation in which it is used, and oftentimes with all the details of it. Thus, Romanes gives the case of a child who saw a duck on the water, and called it "quack." After that he called all birds and insects "quack," and also all liquids. Still later he saw an eagle on a piece of money and called it "quack" again. Lindner's daughter, when asking for an apple, was taught to say "apple," and thereafter used the word as meaning *eat*. Another child used the word "ta-ta" to say good-by; then when anything was taken away; then for the blowing out of a light. Still another used "hat" for anything put on his head, including a brush and comb. Dipping bread in gravy is called a "bath." The palate is the "teeth-roof"; the road is the "go"; the star is the "eye"; all metals are "keys."

In all such cases we notice that the child is trying to classify, and must use what he already has in the way of words to aid him. So also with relations—a much more difficult thing, and one in which a child is likely to get confused. A child will have a vague idea of quantity, but cannot at first express or understand *too much* and *too little*, *too big* and *too small*. He may get them in one situation, but when the same object that is too big for one thing is too small for another, it is beyond him. Here is the root of his trouble with "I" and "you." It is not surprising that little George thought "the Doctor came and shook his (Willie's) head and gave him nasty physic, too." "Buy" and "sell," "lend" and "borrow," "teach" and "learn," are thus all pitfalls for him, and at first are confused. Here again we can trace the race parallel. Many people use "learn" for "teach" and we apply "pleasant," "sore," etc., both to our feelings and the object that causes them. Our abstract words also bear unmistakable marks of their concrete origin. "Spirit" is "breath"; "wrong" is "awry," "twisted," or "bitter"; "right" is "straight," and so on through the list.

Expressing relation

In his hasty generalizing the child makes many mistakes in his conclusions, and so a process of limiting or correcting old concepts and of more carefully forming new ones begins. A good example of such limitation is given by Darwin. His son called *food* "mum," *sugar* was "shu mum," and *licorice*, "black shu mum." Such words as "teeth roof" for palate, "eye curtain" for eyelid, "tell wind" for weather-vane, show both generalization and limitation. On the other hand, of course, if the child's experience of a word is too narrow, he will make ludicrous mistakes in over-limitation. Thus one boy said that

Process of limitation

the good Samaritan poured paraffin into the wounds of the sick man. Oil meant only paraffin to him. The child who entreated his mother to "buy him a brother while they were cheap at the show because children were half price," labored under a similar difficulty. Perhaps also the strict insistence of little children on exactly the same words in retelling a story shows their feeling of a strangeness with words. When Mr. Two-and-a-half-years is asked, "Shall I read to you out of this book?" he answers, "No, but something inside of it," because that is what he wants.

Love of nonsense songs, and of Mother Goose, and the making up of nonsense rimes mark this period also, which may begin as early as three and a half years. A little child will often sit by himself singing over lists of words: *mam*, *pam*, *tam*, *sam*, *jam*, etc., taking an immense delight in it. Sometimes he will rime his answers to your questions, or make all his conversation rhythmical.

With the process of narrowing or limitation well marked, the child's way is comparatively clear before him. It is thenceforth the usual process of the formation of correct concepts as traced by Baldwin. An object is first given which is both percept and concept. When other objects are presented like this in some respects, the same word is used for all, until the child fails to get what he wants by this common word, and so is forced to make species and varieties to go under the larger class. In the expression of the ideas he uses the words that he knows, making new and quaint combinations, but little by little imitation teaches him the conventional signs, and he drops the original forms.

During this first learning of language perhaps the most important thing is that the child shall hear only correct speech and cultivated voices. Baby talk is not

to be used, nor are harsh tones. Slovenly pronunciation, or sharp or loud voices at this early stage will do irreparable harm to the child's speech.

Child's speech

From three to seven years of age the child's language interest is nearly if not quite as strong as before. He loves to practice on new words, whether the meaning is or is not known; alliterations, rimes, and rhythms are very attractive to him, and in some cases like the one given by Wolff, defining is equally so. Free expression now is greatly aided by dramatizing what he knows. He loves both to hear and to tell stories.

From seven to twelve the love of words merely on account of their sound persists, but words also acquire value from their associations. In the latter part of the period the sentence form becomes more complex,—the subordinate sentences increase greatly and statements become both more exact and concise. During the entire period Dr. Hall believes that children should have much opportunity to talk and relatively little to read and write. Correct pronunciation and use of words are best acquired now; the great myths and masterpieces of the race are enjoyed, especially in story-telling. At the same time, the mechanics of reading and writing must be learned at this stage.

Secret languages

During this period we should also note the rise of secret languages. Chrisman found that the curve begins as early as five or six years of age; increases rapidly from nine to twelve; culminates at thirteen, and declines to seventeen or eighteen.

There are many kinds of secret language, varying from the easy "hog Latin," which only adds "gry" to every word, to a very complex inflected language. Frequently such a language lasts for fifty or sixty years

and is passed down from one generation of children to the next. In other cases the language is invented in whole or in parts, and even a dictionary may be made, to which new words are added from time to time.

The length of time such a language is used varies greatly. In some cases the interest lasts only a few weeks; in others, ten or twelve years. Two children who invented their tongue used it so constantly that their parents made every effort to dissuade them from it, but in vain. After two years, however, they gradually began to use English. In another case a man records that he has spoken his secret language to himself for fifty years. That is, he thinks in it, and when he speaks or writes translates into English. The motive for using the language is, as a rule, the desire for secrecy. The older children begin to employ it to keep secrets from those not in their clique; another language is used in another clique, and so on. The language is used in writing notes in school, and on all occasions where mystery and secrecy are desirable.

Size of child's vocabulary

Doran listed words which children could use intelligently, choosing them at random from the dictionary, and found that one boy of nine knew 6,031 words; one of ten at least 10,000; two of twelve 22,000 and 28,400; one of thirteen, 26,300; two girls in second- and third-year academy work, 22,000 and 26,000; one boy in fourth-year academy work, 41,000; two junior college boys, 40,000 and 50,000. His own English vocabulary he lists at about 100,000. There is no way of knowing how representative these returns are, but the writer himself believes that they are probably above the average. The words do not of course always represent new ideas, and the "intelligent use" is an indefinite standard.

At adolescence the interest in words appears not only in the love of certain sounds but in the great increase in slang, in the use of foreign terms, and in attempts to define or use terms very exactly. Miss Williams found in her returns (250) little slang before eleven years, but a culmination at fourteen. Conradi, on the basis of 295 returns, puts the height of slang at thirteen, and of the reading craze and precision in the use of words at fourteen. Both Williams and Conradi attribute the rise of slang to the feeling that the ordinary vocabulary is inadequate to express the emotions of the adolescent. The use of foreign terms, on the other hand, Hall condemns as only an "affectation of superiority and love of mystifying others." It seems to fade with the culmination of secret languages, and may be connected with the rise of secret societies. The sentence form seems to suffer arrest for a year, but then becomes much more involved and intricate. In Conradi's returns 50 per cent take to poetry in the early teens and 28 per cent imitate the style of some favorite author. Interest in telling stories declines rapidly as interest in reading increases.

Slang, precision, foreign words

Bullock's returns from two thousand third- to twelfth-grade children show that the average boy read in six months 4.9 books in the third grade; 6.5 in the seventh grade, and then fewer, until in the twelfth grade, or end of his high-school course, he read only 3. According to Henderson's returns (2,989 children) fewest books were read at nine and most at fifteen years. Kirkpatrick found a sudden rise in the amount read at twelve years, which continues for at least three or four years. Vostrovsky and Lancaster have similar results.

Children's reading

The reading tastes of children, according to these various returns, show the following for boys: Stories of adventure (including war) are popular at all grades, culminating in the eighth; biography, travel, and exploration rise steadily to the ninth; fiction (juvenile) culminates about the eleventh year. The boys want exciting stories, with a hero and numerous incidents. Girls read more than boys. They too, like biography and adventure, but want stories of great women. They read more fiction and poetry and less history, science, and travel. Hall says the high-school girl's reading is more humanistic, cultural, and general; the boy's, more practical and vocational.

Tastes of boys

Tastes of girls

In general, adolescent youth should have free access to the best literature and be encouraged to read freely. During the time that his powers of expression lag behind his power of feeling, expression should not be demanded, but on the other hand spontaneous expression in conversation, declamation, and debate should be encouraged to the utmost. Most writers agree that formal English grammar is a positive detriment both to appreciation of literature and to the development of literary expression.

The problem of learning to read is one that can be only referred to here. Huey and Dearborn both give excellent summaries of the mechanical and psychological factors involved in the act. We wish merely to call attention here to the fact that few people know how to read well. Each individual can train himself to read far more rapidly and easily than he does habitually, without sacrificing accuracy. Huey's section on the psychology of reading is illuminating here, and worthy the perusal of every teacher of reading.

REFERENCES

Language

Allen, M. A. Development of Child's Language. *Mother's Nursery Guide*, Feb. 1893.

Bagley, W. C. Apperception of the Spoken Sentence. *Am. Jour. Psy.*, 1900-01, Vol. XII, 80-130.

Buckman, S. S. Speech of Children. *Nineteenth Cent.*, 1897, 792-807.

Canfield, W. B. Development of Speech in Infants. *Babyhood*, May 1897.

Chamberlain, A. F. *The Child*, 107-171. L. W. Scott.

Studies of a Child. *Ped. Sem.*, 1904 and 1905.

Chambers, W. G. How Words Get Meaning. *Ped. Sem.*, 1904, Vol. XI, 30-50.

Champneys, F. H. Notes on an Infant. *Mind*, Vol. III, 104.

Chrisman, O. Secret Language. *C. S. M.*, 1896, 202-211; *also Century*, 1898, 54-58.

Collins, J. *Genesis and Dissolution of the Faculty of Speech.* Macmillan, N. Y. $3.50.

Conradi, E. Psychology and Pathology of Speech Development in the Child. *Ped. Sem.*, 1904, Vol. XI, 325-380.

Children's Interest in Words, Slang, Stories, etc. *Ped. Sem.*, 1903, Vol. X, 359-404.

Dearborn, W. F. *Psychology of Reading.* N. Y., 1906, 134 pp.

Dewey, John. Psychology of Infant Language. *Psy. Rev.*, 1894, Vol. I, 63-66.

Doran, E. W. Study of Vocabularies. *Ped. Sem.*, 1907, 401-438. (Grammar, High School, and College Students.) Bibliog.

Fay, E. W. Language Study and Language Psychology. *Pop. Sc. Mo.*, 1911, 309-384.

Gale, Harlow T. Vocabularies of Three Children. *Gale's Psychological Studies*, 1900, Vol. I, 70-117.

Gale, M. C., and H. Children's Vocabularies. *Pop. Sc. Mo.*, 1902, 45-51.

Vocabularies of Three Children, at two and three years. *Ped. Sem.*, 1902, Vol. IX, 422-435.

Greenwood, J. M. Vocabularies of Children. *Rept. as Supt. of Kansas City Schools*, 1887-88, pp. 52-65.

Groos, Karl. *The Play of Man*, 31-48, 294-300. Appleton, N. Y. $1.50.

Hale, H. Origin of Language. *Proc. Am. Assn. Adv. Sc.*, Vol. XXXV, 1886. (Account of language invented by children. Summary in Romanes's *Mental Evolution in Man*, 138-144. Appleton, N. Y. $3.00.)

Hammerschlag, V. Disturbances of Speech in Childhood. *Arch. Otol.*, 1906, Vol. XXXV, 379-384.

Heilig, M. Child's Vocabulary. *Ped. Sem.*, Mar. 1913, 1-16.

Holden, E. S. Vocabulary of Children under Two Years. *Trans. Am. Philol. Assn.*, 1877, 58-68.

Huey, E. B. *Psychology and Pedagogy of Reading and Writing.* Macmillan, 1908, 409 pp. Bibliog. (Excellent.)

Humphreys, W. Contributions to Infantile Linguistics. *Trans. Am. Philol. Assn.*, 1880.

Kirkpatrick, E. A. How Children Learn to Talk. *Science*, O. S., Sept. 25, 1891.

A Vocabulary Test. *Pop. Sc. Mo.*, 1907, 157-164.

Lamson, Mary Swift. *Life and Education of Laura Bridgman.* Houghton, Mifflin, Boston, 373 pp. $1.50.

Lukens, Herman. Learning of Language. *Ped. Sem.*, 1894-96, 424-460.

MacDougall, Robert. The Child's Speech. Series in *Jour. Ed. Psy.*, Sept. 1912 to Feb. 1913.

Mach, E. Language: Its Origin, Development and Significance for Scientific Thought. *Open Court*, 1900, Vol. XIV, 171-178.

McKendrick, J. G. Experimental Phonetics. *Nature*, 1901, 182-189.

Mallery, G. Sign Language among North American Indians. *1st An. Rept. Bureau of Ethnology*, 1881. (Also summarized in Romanes's *Mental Evolution in Man.* Appleton, N. Y. $3.00.)

Mateer, Florence. Vocabulary of Four Year Old Boy. *Ped. Sem.*, 1908, 63-74.

Noble, E. Child Speech. *Education*, Sept. and Oct. 1888.

O'Shea, M. V. *Linguistic Development and Education.* Macmillan, 1907, 347 pp. Bibliog. (Very complete.)

Pelsma, John R. Child's Vocabulary and its Development. *Ped. Sem.*, 1910, 328-369.

Perez, B. *First Three Years of Childhood*, 234-262. Bardeen, Syracuse. $1.50.

Pollock, F. Infant's Progress in Language. *Mind*, Vol. III.

Preyer, W. *Mind of the Child—Senses and Intellect*, 99-188. Appleton, N. Y. $1.00. (Very detailed and accurate account

of speech from birth to three years. *See* appendix for summary of Sigismund, Löbish, Taine, Strümpell, Darwin, Vierordt, Schultze, Lindner, Tiedemann, Feldmann, Holden, Haldemann, Humphreys.)

Rankin, Jean S. Eighth Grade Vocabulary. *Ele. Sch. Teach.*, 1911, 465-468.

Ribot, Th. Abstraction Prior to Speech. *Open Court*, 1899, 14-20.

Evolution of Speech. *Open Court*, 1899, 266-278. (Anthropological in nature.)

Romanes, G. J. *Mental Evolution in Man.* Chapter VI. *Also see* Index. Appleton, N. Y. $3.00.

Salisbury, A. A Child's Vocabulary. *Ed. Rev.*, Vol. VII, 289-290. (Vocabulary of child at 32 weeks and 5½ years.)

Sanford, E. C. Language of Children. Notes. *Ped. Sem.*, 1891, 257-260. (Summary of many men.)

Scripture, E. W. Terminal Verb in Infant Speech. *Science*, O. S. Vol. XXIII, 62. (Observation to show that English child sometimes naturally puts infinitive at end of sentence, instead of directly after verb.)

Researches in Experimental Phonetics. *Yale Psy. Lab. Studies*, 1899, Vol. VII, 1-101.

Elements of Experimental Phonetics. Scribner's, 1902, 627 pp.

Stuttering and Lisping. Macmillan, 1912, 251 pp.

Sholty, Myrtle. Reading Vocabulary of Children. *Ele. Sch. Teach.*, Vol. XII, 1912, 272-277.

Smith, M. K. Psychological and Pedagogical Aspects of Language. *Ped. Sem.*, 1903, Vol. X, 438-458.

Stern, W. and C. *Die Kindersprache.* Barth, Leipzig, 1907, 394 pp.

Stevenson, A. Speech of Children. *Science*, O. S., Mar. 3, 1893.

Sully, James. *Studies of Childhood—The Little Linguist* Appleton, N. Y. $2.50.

Taine, H. Acquisition of Language by Children. *Mind*, 1877. *On Intelligence.* Vol. II, 138-151. Holt and Co., N. Y. $2.50.

Thomas, C. J. Aphasias in Children. *Child Study*, 1909, 97-109.

Thorpe, E. J. What Teachers Need to Know about Speech Impediments. *Proc. N. E. A.*, 1903, 1031-1036.

Trettien, A. W. Language Interest of Children. *Ped. Sem.*, 1904, Vol. XI, 113-177. (Good.)

Whipple, Guy M. and wife. Vocabulary of Three-Year-Old Boy. *Ped. Sem.*, 1909, 1-22.

Williams, Lillie A. Children's Interest in Words. *Ped. Sem.*, 1902, Vol. IX, 274-295.

Wolfe, H. K. Color Vocabulary of Children. *U. of Nebraska Studies*, July 1890, 205-245.

LITERATURE

Anderson, Roxanna E. Reading Tastes of High School Pupils. *Ped. Sem.*, Dec. 1912, 438-460.

Arnold, Gertrude W. *Mother's List of Books for Children.* McClurg, 1909, 270 pp.

Baker, F. T. (comp.). *Bibliography of Children's Reading.* Teachers' College, N. Y., 1908, 129 pp.

Black, Jessie, and Warren, Irene. Reading for Children in Elementary School. *Ele. Sch. Teach.*, 1911, 145-150.

Blanchard, Alice A. Story Telling as a Library Tool. *Ped. Sem.*, 1909, 351-356.

Books for a Girl's Pleasure. *Pub. Lib.*, 1911, 110-111.

Boy Scouts' Library. Pearson, Lond., 1910, 6 vols.

Bryant, Sara C. *How to Tell Stories to Children.* Houghton, Mifflin, 1905, 260 pp.

Bullock, R. W. Children's Reading. *Proc. N. E. A.*, 1897, p. 1015.

Burnite, Caroline. Standard of Selection of Children's Books. *Lib. Jour.*, 1911, 161-166.

Literature for Children. *Lib. Jour.*, 1906, 107-112; *Pub. Lib.*, 1906, 360-362.

Cannons, H. G. *Descriptive Handbook to Juvenile Literature.* Lond., 1906, 312 pp.

Children's Literature. Training Dept. Los Angeles (Cal.) Normal School, 1908, 88 pp.

Coussens, Penrhyn W. *One Thousand Books for Children.* McClurg, 1911, 224 pp.

Davidson, Lelia. Folklore and its Place in Child Life. *Story Hour*, 1909, 43-49.

Field, Walter T. *Fingerposts to Children's Reading*, 1907, 275 pp.

Fraser, Margaret C. Children's Magazines. *Pub. Lib.*, 1911, 151-153.

Godley, Eveline C. A Century of Books for Children. *Living Age*, 1906, 689-698.

Hall, G. S. What Children Do Read and What They Ought to Read. *Jour. of Ped.*, 1905, 46-51.

Hewins, C. M. Reading Clubs for Older Boys and Girls. *Ped. Sem.*, 1909, 325-330.

Hill, David S. Child and the Reading Habit. *Rel. Ed.*, 1910, 461-472.

Kelly, Beatrice M. Selection of Juvenile Books for a Small Library. *Pub. Lib.*, 1909, 367-372.

Lee, Gerald S. *The Child and the Book.* Putnam's, 1907, 161 pp.

Library Work with Children. *Pub. Lib.*, 1906, 193-202.

Lowe, Orton. *Literature for Children.* Macmillan, 1914, 294 pp., 58 of them bibliography.

Lyman, Edna. *Story Telling.* McClurg, 1910, 229 pp.

MacClintock, Porter Lander. *Literature in the Elementary School.* U. of Chicago Press, 1907, 305 pp. (Compiled in connection with the work in the School of Education. Good.)

McConkey, Bertha M. Literature in Elementary Schools. *Jour. of Ped.*, 1905, 225-230.

Macy, J. A. *Child's Guide to Mythology.* Baker and Taylor Co., N. Y., 1909, 273 pp.

Moses, M. J. *Children's Books and Reading.* N. Y., 1906, 272 pp.

Children's Library and the Home. *Outlook*, 1907, 177-185.

Olcott, Frances. *Children's Reading.* Houghton, Mifflin, 1912. (Good.)

Partridge, Emily N. and G. E. *Story Telling.* Sturgis and Walton, 1913, 323 pp. $1.25. (Good.)

Potter, Marion E., *et al. Children's Catalog . . . based on 24 selected library lists.* Wilson Co., 1909.

Salisbury and Beckwith. *Index to Short Stories.* Chicago, 1907, 118 pp.

Shaw, Adele M. Reading of Children. *Critic*, 1900, 177-180.

Shute, Katherine H. Literature in Elementary Schools. *Sch. Rev.*, 1906, 484-491.

Smith, Franklin O. Pupils' Voluntary Reading. *Ped. Sem.*, 1907, 208-222.

Stanley, Harriet H. 550 Children's Books. *Am. Lib. Assn.*, Chicago, 1910, 24 pp.

Story Teller's Magazine. Pub. by Story Teller's Co., N. Y. 10 cents.

Struthers, John. Reading of Public School Children. *Rel. Ed.*, 1910, 465-478.

Van, Lila. What Children Read. *Pub. Lib.*, 1906, 183-185.

Wyche, Richard I. *Some Great Stories and How to Tell Them.* N. Y., 1910, 182 pp.

Stories and How to Use Them. *Story Hour*, Nov. and Dec. 1908, 7-14, and 7-10.

CHAPTER XVIII

Rhythm, Dancing, and Music

1. Ask adults and children to name the first ten nursery rimes that come into their heads.

Observations

Note the rhythms.

2. Compare the rhythm and time of tunes in your head with your heartbeat and breathing.

3. Notice what songs your children sing most spontaneously.

4. Ask what song they like best, and notice whether the liking is due to

(1) Season, as Christmas songs.

(2) Imitation.

(3) Permanent interest.

5. Try to get song composition from some child or small group of children uninstructed in music.

6. Observe the spontaneous reactions of children to music with a strong rhythm.

In going over the literature on rhythm we find various discussions as to its fundamental nature, whether it is inherited or not, and so on. It is on the whole accurate enough for our purpose to say that rhythm is a dividing into parts by a regular succession of elements, whether they be movements, sounds, lines, colors, or what not. The division is marked by the first or last unit in the group being made emphatic in some way, while the others are unemphatic or unaccented; that is, they run along without attention being especially called to them. The unaccented units may

Nature of rhythm

apparently have almost any characteristics, so far as their relations to each other go, so long as they have the same lack of emphasis, but the instant that one of them becomes more emphatic than the others the old rhythm is broken up, or else is complicated by a sub-rhythm within it. We do not even need to make the elements of a rhythmic group appeal to one sense, but can alternate sights, sounds, and movements, and it may be smells and tastes as well.

The accented unit may be made so in a great variety of ways. The most common, of course, is by greater intensity in the movement, sound, color, or what not; but it may also be done by rest or omission—no movement or sound, or a dull or indifferent color. A higher or lower pitch, a different color, or a different movement, none of them requiring greater expenditure of energy than the other units, but different from them and recurring regularly also may give the necessary emphasis. To state it again in the most general way, it would seem that the essential relation in rhythm is that of one regularly recurring accented unit, with any number and variety of unaccented units.

Before taking up rhythm as related to music, let us first notice how general a thing it is and how it underlies all mental activity.

Universality of rhythm

Natural phenomena almost universally take a rhythmical form. We have first the great swing of the worlds in their course about the center of the universe, in a rhythm never yet completed. Then we have the course of each world about its sun, of each satellite about its world, and the rotation of the various worlds upon their axes, making the rhythms of the year, month, and day. In our sun there seem to be rhythms recurring about every eleven years, causing our sun spots,

and, it is seriously conjectured, affecting the harvests of our earth and resulting in disturbed atmospheric and organic conditions which lead to our periodical money panics and outbreaks of crime and suicide. However this may be, it is unquestionable that the yearly, monthly, and daily rhythms seriously modify both the vegetable and animal creation. Some plants have a daily rhythm of growth and rest; most of them have an annual one; all seek the sun. Even the moon influences the growth of some plants.

In the animal world there are corresponding rhythms. Growth is faster in summer than in winter, and we can each observe annual rhythms in our mental moods according to the seasons. Certain states of mind and even trains of thought are likely to recur with each season. "Spring poetry," so much laughed at, or something corresponding to it, is, I suspect, written by many more people than are willing to acknowledge it.

The monthly rhythms seem to be especially connected with the reproductive and nervous systems. The period of gestation in various species of animals is usually a month, or a number of days which is seven or some multiple of seven. Disturbances of the nervous system, recurrent insanities, abnormal cravings for liquors and other stimulants, are also likely to have a rhythm.

Weekly rhythms are less clearly marked, but as we saw in the chapter on growth, there is a weekly rhythm of growth which was probably the cause of the change in our manner of living on Sunday. It has led to certain rhythms of thought and feeling. We sleep later, we are hungry at different times, and we think differently.

The daily rhythm of sleep and waking is universal, and it seems to be accompanied by one of growth. This

is a genuine organic rhythm, caused probably by the rhythm of day and night, and cannot be easily changed so that we shall sleep in the day and work at night.

There are many other bodily rhythms, of which we will mention only a few: the pulse and heartbeat, respiration, walking, and speech. Every cell seems to have its own rhythm of alternate activity and rest; the nervous system sends out rhythmical stimuli, differing in different parts. Thus the brain can send out only about thirteen per second, and the cord about thirty-four. Fatigue is also a rhythmical thing, a period of exhaustion alternating with one of recovery.

Special bodily rhythms

Not only is every bodily process a rhythmical one, but every mental one as well. It is, however, still uncertain what determines our tempo when we listen to a monotonous stimulus like the metronome, or when we voluntarily tap with our finger. In the latter case the same person varies greatly at different times in the speed of tapping, and different subjects of course vary. Even when he has an external stimulus like a metronome or clock, the same subject may *group* differently at different times.

Causes determining tempo and rhythm

Dr. Bolton found that in listening to a series of uniform clicks the most common grouping within the widest limits was by 2's, when the rate of the clicks was moderate; when fast, by the heartbeats. When the stimuli were .795 seconds apart, the mind grouped by 2's; .460, by 3's; .407, by 4's. Usually he found that the breathing accommodated itself to the rhythm instead of vice versa.

Various investigators have thought that the tempo was set by some of the organic rhythms or automatic bodily activities. It has been supposed that the time for a double swing of the legs in walking, .663 seconds

on the average, determines the group; or that the average number of voluntary muscular contractions—10 to a second—determines the rapidity with which stimuli may come in order to be rhythmically grouped, this also coinciding with the rate of nervous discharge of the cortical cells; approximately to the number of syllables which can be pronounced in a second; and to the shortest time in which we can get a complete simple perception, such as distinguishing one color in a group of colors.

Length of rhythm

But the length of the rhythm is also unsettled. Investigators differ, for instance, as to the length of the wave of attention, Lange setting it for light stimuli at 3.4 seconds, Münsterburg at .6.9, and Lehmann at 12.8. There is equal disagreement as to the length for sound and electric stimuli. The fatigue wave seems to be irregular, and the respiration wave is variously stated at from 2.5 to 4 seconds. The average pulse rate is 72 for males and 80 for females.

With the organic rhythms varying within such wide limits it does not seem probable that any one of them always determines the rhythm involuntarily selected. On the other hand, it may be that the one which happens to be most prominent at a given time will determine the tempo then selected, at another time, another, and at still another time the contractions of some group of voluntary muscles.

Most liked rhythms

The rhythms which we fall into most naturally are well known. A 2-rhythm or multiple of it is by far the most commonly chosen and liked. Triplett and Sanford asked persons to send in lists of the first ten nursery rhymes that came into their heads, and they found in these lists that by far the most common was one with a stanza of four lines and four stresses, the lines riming in couplets, such as, "Georgie Porgie."

Second came a stanza with the first and third lines of four stresses and the second and third of three, like "Mistress Mary." Then came three three-stress lines and one four-stress, with the last line a repetition of first,—"Hickory, dickory dock."

Grouping by 5's is always rather difficult, and grouping by 3's is not nearly so common as by 2's or some multiple of 2. This we naturally refer to the fact that most of our bodily movements are in 2's, such as walking, and that even when one side alone is used, the opposition of flexor and extensor muscles creates a rhythm.

The time limits for the rhythmical grouping of sounds have also been studied. We know that when sounds follow each other at intervals of about .550 a second (that is, slightly over one half a second, varying slightly for different adults) they are grasped with the greatest ease and pleasure, and if the sounds are alike objectively the listener tends to group them into rhythms either of 2 or 4. If the listener is not allowed to count he cannot grasp at once more than six single impressions, but if the sounds are arranged rhythmically, and with different times, he may grasp at once five or six rhythmical units, each unit containing a considerable number of beats, some say as many as twenty-four. With training, rhythms may be perceived in sounds following at intervals as small as one fifth of a second, or as large as three seconds, but beyond these limits it is impossible for most adults to appreciate them.

Time limits

P. F. Swindle (Inheritance of Rhythm, *American Journal of Psychology*, April 1913, pp. 180-203) gives some interesting data to show that rhythm is not inherited, as is commonly assumed, and that the preferred tempo and the most common rhythms are dependent upon the bodily organism. Large members require more time than

the small, and often it is necessary to make tentative movements before actually doing the act. Again, we are bilateral, and one side is always somewhat stronger or more skilled than the other. All these factors combine to explain accent. Our inherited structure thus favors two rhythms.

But his experiments showed that if subjects are put under the appropriate conditions they can develop five, seven, and more complicated rhythms, and that with children, in whom the habits of two and three rhythms are not so fixed, there is no greater difficulty in learning five than six rhythms. The point is that life conditions do not often demand movements in five rhythms.

Again, he had the rhythms learned in two ways, first merely by counting and second purposely, by which he means that attention was fixed on doing a certain series of movements and at the same time the subject was required to pronounce letters or numerals exposed, so as to shut out counting. Series learned in the latter way were much better remembered, and on this ground Swindle criticizes Dalcroze, who allows his pupils to count, although he says that good pupils do not. Swindle believes, however, that most of Dalcroze's pupils do count, and to a large degree forget the rhythms learned.

Turning now to the value of rhythm, Wallaschek tells us that the primitive song and dance were a practical necessity to prepare the tribe for needed action or to maintain skill in times of peace. Tribes which play at war and hunting act together better than those that do not. Again, it has been supposed for some time that work songs have a practical value in regulating the movements, and Margaret Smith has made various laboratory tests which seem to demonstrate the truth of this.

Practical value of rhythm

She found that rhythms are very decided helps in memorizing (this indeed we all know), that probably writing in rhythms goes on better than without them, and that heavier weights can be lifted to rhythms.

In fact, any movements which can be adapted to a rhythm can be more readily learned and longer retained, even spelling, and a teacher ought to encourage children to use this aid.

On the other hand, a word of caution must be given here, that the time and character of the most favorable rhythm seem to vary with different people. Miner, for instance, tried an experiment to test the use of tapping with the fingers while filling words into the blanks of a poem. He found that the tapping was a hindrance to the brighter pupils and an aid to the duller, and that the same was true when the rhythm was given by the metronome at different rates, while the subject was sorting out a pack of cards. That is, the dull pupil seems to need a little external stimulus to jog his attention to its best gait, while such a stimulus merely throws the attention of the bright pupil off its more delicate balance. This much, however, we can say with considerable confidence, that when a pupil who is studying is seen making rhythmic movements with any part of his body, they are probably of value to him.

Origin of the dance

But besides the rhythms already discussed there are other life-activities which have developed and harmonized our bodies and predisposed us to their rhythms. It was inevitable that when man was wise enough to begin to play and to worship, various forms of the dance should arise before any other art-form developed. Could anything be more instinctive and natural than for a man who had had a successful hunt to act it over before his admiring fellows, imperfect

word being helped out by gesture and act? Such recitals by degrees became formalized into a certain dance, and so we find among primitive peoples dances symbolic of all their life-activities. Such dances serve the purpose not only of preserving traditions but of arousing once more in the youth the same high feelings as inspired the men who did those deeds. The use of the muscles in these old racial ways, usually more deeply and vigorously than modern life demands, tends to revive the pristine energy and zest which so many of us lack to-day. Dancing that would be educative ought, then, to train the young in these old national and folk dances so far as it can revive them, and if such are lacking there ought to be a re-creation of them. At this point we see how very closely dancing and the drama are connected. The modern movement for children's theaters, in which children are the actors, is but one form of this whole tendency to recapitulate our race-life through our muscles, and much of the drama is dancing in this very wide sense which I am now discussing. Dancing but omits words and usually adds external rhythm, becoming more highly symbolic than acting.

Work dances

In many of our schools children are acting out the various activities which they see about them,—such as carpentering, shoemaking, and other trades,—with the greatest enjoyment. Why could they not go a step farther and represent the most fundamental of these activities in dances? There might be, for instance, the sower's dance, the reaper's dance, the weaver's and spinner's dances, the hunter's dance, and others symbolic of securing shelter, all typifying the great fundamental needs of man for food, clothing, and shelter.

Again, another motive for the dance is love. In the mating season many sorts of male birds show off before

the females, and in some cases there are fancy steps, tentative flights, preening of feathers, and so on, which are ludicrously like some of the exhibitions in our ballrooms. Among savages there are many forms of love dances, and in modern times, among civilized peoples, degraded forms of the love dance are nearly the only ones known. Under the unhygienic conditions of the ballroom, with its artificial stimulants of excessive light and heat, and with the common use of wines and other stimulants, such dancing is inevitably bad and must be condemned by all thoughtful people. But instead of banishing it, we ought to reform it. If our assumptions are true, even these degraded dances appeal to some of the most fundamental instincts, and those instincts ought to be given a better outlet under good conditions. The dance ought not to be confined to young people, but shared by all. Whenever possible it ought to be out of doors, and all the conditions should be such as to normalize the relations between young men and women, and deepen their mutual respect and admiration. We are foolish and prudish not to recognize that much of the attractiveness of dancing comes from the presence of both sexes, and that it is an agency by which we may accomplish much harm or good.

Love dances

But though to-day the love dance has held the center of the stage, in the history of dancing this phase has been much less important than has the religious aspect. Just as men tended to formalize their daily occupations to dance and drama, so did they their reactions to the great powers and mysteries which surrounded them in nature. As far back as we have any history of religion we find that dancing was always a part of its ritual, and often the chief part. These dances take various forms. Sometimes they are imitations of

Religious dances

natural forces, such as the movements of the heavenly bodies; sometimes they are symbolical of or accompany the offering of sacrifices, and sometimes they are closely connected with ancestor worship and are a symbolic representation of the life and deeds of the great tribal ancestor or totem. Or again, they may be propitiatory in nature, prayers for rain or for deliverance from famine and pestilence, or dances of thanksgiving. Oftentimes they may be danced only by those initiated into the inmost mysteries, and it is supposed that in some of the Greek mystical brotherhoods an important part of the initiation consisted in learning the symbolical dances connected with their worship. In the Old Testament dancing is constantly referred to as a part of worship, especially on occasions of great public rejoicing and thanksgiving, and the early Christian church included it in its ritual.

And finally, one motive for dancing, and the chief one to-day, is the play impulse. Any animal with superfluous energy gambols and leaps, and when these movements are cadenced to external rhythm we have dancing.

Play impulse

We find among many people a love of moving to rhythm, and endless patience in working out the steps and movements best suited to a given piece of music. Indeed, many persons love music in proportion as they can find motor expression for it, and care relatively little for its melodic factors. This seems to be especially true of children, and Jaques Dalcroze has made use of this fact in working out his system of eurhythmics, which he developed originally as an aid in teaching singing. He found that he could hold the attention of his pupils better and get a better use of the voice if he allowed them to make movements, and by degrees he worked out a very elaborate system which now has representatives both in

England and America, and which opens possibilities of reforming not only modern music and dancing but the opera and perhaps the drama.

Let me describe it as it is outlined in Dalcroze's *Rhythmische Gymnastik* and in various articles. Dalcroze would begin with six-year-old children, giving them three half hours a week from six to twelve years of age, and allowing them, if they desired, to begin instrumental music at eight years. The first exercises are very simple,—marching to pronounced rhythms, beating simple times, and breathing properly and regularly. Every lesson opens with preliminary exercises in breathing. There are also at the beginning of his volume exercises which are avowedly only gymnastics, given for the purpose of making the muscles flexible.

Dalcroze eurhythmics

The fundamental thing in these exercises is the association of notes to movements. The unit in his system is the quarter note, or crotchet, which is always expressed by one step forward; the half note is one step and a bend of the other knee; the dotted half note is one step and two movements of the other foot; the whole note one step and movements. The smaller divisions of eighths, triplets, and so on, are expressed by steps quicker in proportion to their frequency; rests of various lengths seem to be simply pauses in position, the movement being continued after the rest; syncopation is expressed by a forward step and a bow, and so on.

With this progress of the musical movement the arms beat time and the voice carries the melody, when one is introduced. In the beginning, however, all the rhythms are given on only one tone, middle *c*, and Dalcroze asserts that the constant hearing of this tone so fixes it in the mind that absolute pitch is acquired.

The pupil begins then with the simplest exercises in

marching and beating time, stopping and beginning at the unexpected command and repeating until he can do this automatically. He is trained here to listen to rhythms and then to reproduce them from memory, and by slow degrees exercises are introduced which make the arms and legs independent in action, and then the arms independent of each other and of the legs and head, until the advanced pupils may be carrying different rhythms with the legs, each of the arms, the head, and perhaps with the voice. The most complicated rhythms are easily expressed, many far more complicated than are now used in musical composition, and Dalcroze foresees that his method may thus react upon musical composition. These of course come only at the end of the course for adults, and are brought out chiefly in the exercises in improvisation.

These exercises are carried on by Dalcroze, who improvises at the piano, the pupils realizing the improvisation. Here there seems to be great individual freedom of expression allowed, and it passes naturally into plastic expression, in which various combinations of movements portray emotion. The group work is also a branch that seems to have great artistic possibilities. Here each pupil follows a certain part of the music, so that the whole group represents the harmony, giving us quite literally visual music.

Dalcroze has not yet published that part of his work which gives his method of tone training, but Blensdorf-Eberfeld (*Päd. Reform* for Jan. 8, 1913) takes it up. As I understand it, Dalcroze does not consider this so essential as the rhythmical training, and lays no claim to especial originality here.

In the beginning all the exercises are given to middle *c*, and when the training in tone discrimination begins the

name of *do* is given, and its relations to *re* and *mi* are taught, with many exercises and in all the times and rhythms previously carried out to one tone. At the same time the position of the three notes on the staff is given in three octaves. Each time a new tone is introduced the beat is made very simple, and it is sung to *la* until the tone is thoroughly learned. At first only the whole steps are learned, and when the half step is introduced much practice must be given on it, but after that everything is easy and the pupil relatively soon can sing the scales, at first of course learning *C major*. Since the pupils have learned the absolute pitch for middle *c*, or *do*, all the scales can be built up from *C major* by simply teaching the varying placing of the half steps, and drill is given until every major scale has been thoroughly learned and all can be sung at command, from *C sharp* around to *C flat*. A pupil can thus at will place himself in any scale by singing in thought first the key desired and then giving it aloud and getting the starting tone. This amazing mastery of the keys is said to be easily acquired, and with it transposition has little difficulty.

Following this come exercises in intervals and accords, by which Dalcroze means not merely the usual thirds, fifths, and so on, but all the notes between as well. Here are numerous exercises to bring out all the relations of the tones, and finally reversal of the accords. Then come the minor scales, on which a large part of the third-year training is spent.

All this seems to have been worked out entirely from the empirical side, and it still lacks adequate theoretical expression. What little theory there is is as follows: Men have confused thoughts and undefined emotions because their bodies are undeve.oped, are without natural rhythmical expression. But sensations must be disciplined

and impulse trained in order to develop any personality or give it free avenues of expression. Many persons have emotions which they cannot express in acts because they lack bodily control or do not know how to express them, and rhythmic gymnastics can help both of these classes. Rhythmic movements are not primarily either acting or dancing, but a means of freeing the mind. They are inevitably beautiful and harmonious, and are the basis of all art because they give rhythmic expression to our emotions.

Rhythmic bodily movement, therefore, is the germ of art, the common source of all the musical arts on one side and the visual arts on the other. The human body is the point of departure for all forms of art, and we may properly suppose that in porportion as it is harmonious and rhythmical art will become high and noble.

Turning now to music, it seems probable that at first language and music were not distinct, the cry being the common root from which the two have developed in different ways. Music proper, or melody, seems to arise first in connection with the dance, and the dance in its original form was the reproduction of the activities of existence or, it may be, a propitiation of the gods. Uniformly the dance takes a rhythmic character. At first it is performed in silence, but as the dancers are aroused they give vent to their feelings in more violent movements, and in cries, the cries naturally assuming a rhythmic character consonant with the movements. Thus the rude song is born, a song without words, and in almost a monotone.

Origin of music

This theory fits in very well with what we can see of children's natural musical tastes. The development of melody and harmony is much later than the appreciation of rhythmical cries. Gurney says that the former

does not appear until four or five years. We should expect kindergarten children, then, not to care so much about singing the melody as about keeping time.

Small children are more easily terrified by loud sounds than by almost anything else. Preyer and Perez note that in the seventh and eighth weeks a child listened to the singing of lullabies with much pleasure, and showed an appreciation of piano playing by his vigorous movements and laughter at the loud notes. Children of six months show great enjoyment of music; at nine months some will reproduce musical tones. Perez also records the case of a child who sang himself to sleep when only nine months old. By the age of a year some will reproduce tones quite perfectly. Sigismund says that musical tones are imitated before spoken ones. Noises of all kinds, even the unpleasant, appeal to children, especially if there is any rhythmic arrangement, and they delight in reproducing them as far as possible.

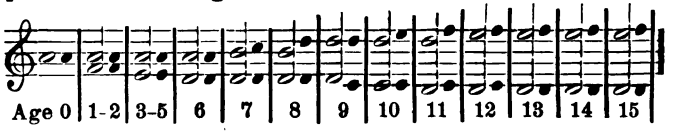
Child's love of noises

Children vary greatly among themselves and at different ages in their ability to distinguish tones. We find the child who sings the scale in one tone from *c* to *c*; and another who can sing the chromatic scale with ease. Whether any given child is tone-deaf, or simply lacks training, can be told only by experiment, and, even if not up to the average, many a child's ability can be improved by practice. Heilig's child was not taught music but often heard her mother giving music lessons. At fourteen months she sang the whole scale alone and unprompted, and at fifteen and two thirds months sang it descending as well as ascending. At twenty-one months she sang seven songs, using *la* instead of words. In the twenty-third month she began to sit at the piano and play with the keys, and she thus learned the scales, various chords, and some tunes.

Sensitiveness to tones

Monroe collected data from 161 children under six years. He found that from four to five years 34 per cent of the boys and 59 per cent of the girls could learn the scale, and that at six 41 per cent of the boys and 71 per cent of the girls. The greatest difficulties came in perceiving the high notes, and songs were better remembered than scales.

Range of child's voice

We might fairly question to what extent the difficulty with these children was due to the limited range of the childish voice, which at six years is only five tones. We have no data for American children, but the following table shows the range of German children's voices. It embodies tests by Paulsen on two thousand seven hundred and eighty-five boys from six to fifteen years of age and two thousand two hundred and fifty-nine girls from six to fourteen; and by Gutzmann on five hundred and seventy-five children. It shows the pitch of 75 per cent of these children at each age, the half notes representing the boys and the quarter notes the girls.

In children from six to nineteen years of age, the least sensitive age is six, when the least perceptible difference of two tones is about one-quarter of a tone. Thence to nine years there is twice as much gain in sensitiveness as from nine to nineteen years; and afterward a more gradual gain, with a break and retrogression at ten and at fifteen years.

The actual tastes of children seem to have been little observed. Miss Gates had answers from two thousand children, one hundred boys and one hundred girls for each year from six to sixteen.

1. She found that 22 per cent of the girls and 12 per cent of the boys of seven years like best lullabies and baby songs, while 14 per cent of the girls and 7 per cent of the boys like home songs the best. "Home Sweet Home" is the favorite. Of the seven-year-old boys and girls 43 per cent like school songs the best; nature songs are the favorites. Twice as many boys as girls like negro songs. "Suwanee River" and "Massa's in the Cold, Cold Ground" are the favorites. **Songs liked by children**

2. Religious songs are best liked by two hundred and ninety-six girls and six hundred and ninety-six boys at six years; 23 per cent of the girls and 6 per cent of the boys at thirteen years; 27 per cent of the girls and 6 per cent of the boys at sixteen years, making an average of 18 per cent. "Nearer my God" is the favorite.

3. National songs are best liked by 13 per cent of the girls and 18 per cent of the boys at seven years; 29 per cent of the girls at twelve years; 40 per cent of the boys at eight years. "America" and the "Star Spangled Banner" divide the honors here. Marsh gives this table of "The one song he liked best in all the world." The returns are from six thousand three hundred and thirty-eight children. The table is given in percentages.

Boys

Grade	School	Sunday School	Patriotic	Street	Home
1.....	43	10	26	9	9
2.....	39	11	29	9	10
3.....	29	8	40	14	10
4.....	12	10	42	21	12
5.....	7	11	30	18	12
6.....	6	4	15	17	21
7.....	11	10	48	20	10
8.....	9	68	60	9	14
9.....	3	1	58	9	26
10.....	3	0	65	5	25
11.....	0	16	25	33	25

GIRLS

GRADE	SCHOOL	SUNDAY SCHOOL	PATRIOTIC	STREET	HOME
1.....	43	15	13	6	11
2.....	43	10	15	6	11
3.....	39	11	25	8	15
5.....	12	15	32	15	24
6.....	9	9	37	17	26
7.....	13	19	20	21	17
8.....	16	22	32	2	26
9.....	3	1	21	7	35
10.....	1	10	47	4	38
11.....	0	29	27	0	44

BOYS AND GIRLS

GRADE	SCHOOL	SUNDAY SCHOOL	PATRIOTIC	STREET	HOME
1.....	45	13	23	8	10
2.....	42	16	23	8	11
3.....	39	9	31	11	12
4.....	19	14	35	16	13
5.....	9	13	41	17	18
6.....	7	7	43	17	24
7.....	12	15	37	21	14
8.....	13	16	44	5	21
9.....	3	2	59	9	27
10.....	2	7	53	5	33
11.....	0	26	26	7	41

Many reasons are given why the favorite piece is liked. As children grow older, more say it is because they like the music or words, and fewer because they have associations with it, or it is nice, pretty, or sweet. The associations are of all sorts — of home, Christmas or some holiday, with historical events, or simply with smell or some other sense. A very small percentage of the favorites are movement songs, and as a rule major keys are preferred to minor.

It is interesting to note the changes in taste with advancing years. The school songs show these variations: boys and girls, 43 per cent in first grade to 9 per cent and 16 per cent respectively in eighth grade, and none in eleventh grade. **Changes in taste**

S. S. songs, boys, 10% in 1st grade, to 16% in 11th grade.
" " girls, 15% " " " 29% " "

Patriotic songs show remarkable fluctuations in the liking of the boys and girls, as the table indicates. Street songs increase in number to the fourth grade; decrease slightly to the seventh and rapidly to the eleventh. They then rise suddenly to 33 per cent in the eleventh grade.

With the girls the curve is of the same nature though of a smaller percentage, except that at the eleventh grade it decreases to 0 instead of rising.

The percentage of home songs increases to sixth grade, falls in seventh grade, and then increases gradually.

The subject of children's musical composition is one that is not considered nearly as often as children's drawings, and yet there would seem to be no reason in the nature of the case why children should not be creators of songs as well as of landscapes. **Songs by children**

The first musical productions are not distinct from the beginning of speech. The child cries, howls, gurgles, and babbles, not only when he is hurt or pleased, but just to see what sounds he can make.

Sometimes one set of sounds takes possession of him for a time, and he will seem unable to keep from repeating it. Perez gives a case of a little girl who repeated "tira-tira" for two weeks. Children a little older delight in nonsense rimes, in chain rimes, in alliteration, and will make up all sorts of rimes and tunes for them. Children of all ages experiment in producing noises not only

with the vocal organs but also with any instruments they can get hold of. At first their song is monotonous, hardly to be distinguished from the speaking voice, but by the age of four or five years the two are well marked.

There seems to be a genuine impulse to musical expression in many children which, although modified by imitation, is still a true originality.

William Platt found that his children spontaneously crooned melodic phrases, put words to music, imitated musical sounds, and so on, and both he and Koenig believe that children should create melodies from the beginning, just as they draw and model.

So far as my knowledge goes, however, the only systematized work in this direction is that under the charge of Mrs. Kern. Her account is so suggestive that it is given here in full, with some of the songs.

Song Composition[1]

That music is an important factor in the growth of the child's æsthetic nature is a fact generally conceded. Is it, however, practically made use of? Is the nursery, which we now realize must be artistic as well as wholesome, furnished with the means of producing beautiful sounds—failing the human voice, with the *vox humana*, or other soft-toned instrument?

As early as he is shown beauty in color and form the child should have beauty in tone and melody given him. There are no unmusical children. Interest in musical expression is one of the natural resources of the child, and unconsciously he will awaken to a melodic

[1]By May Root Kern.

conception through repetitions, in pure and gentle tone, of melodies suited to his understanding. This process cannot be begun too early. Having understood, the child possesses a mental picture which he seeks to express by humming or singing. This expression of an æsthetic impulse is as natural to the child as his expression in color. Needing no utensil, it is simpler, and would be more readily used were his early environment as full of tone as of color. The more he hears of this music, the more he assimilates and the more he has to express. And not alone through imitation. If he be given a poetic phrase which touches his imagination, he can give his own melodic conception of it; and the awakening of this creative faculty brings a joy which stimulates the growth of his whole æsthetic nature.

There is nothing more precious to a child than his own creation, and to preserve his melodic thought he will wish to acquire a knowledge of the symbols necessary to express it. The basis for a study of the science of music is formed by his desire to express various forms of melodic thought. He realizes the necessity for the controlled use of his fingers to express them beautifully on the keyboard, and grasps the necessity of manual drill. His whole study of the technique of piano playing is illumined, and the proper relationship of idea and its servant expression has been preserved. Problems introduced by the growing intricacy of his conceptions—key relationships, transposition, harmony—are mastered with a natural motive, and, led by his own impulse, he is ready with open mind and heart to receive, according to his capacity, the riches which master-minds are still pouring into the music treasuries of the world.

In the school, a problem to be coped with arises from the diversity of musical attainment in the groups. Children from non-musical environment are to be handled with others who are developed musically. To lessen the chasm, much thought is given to creating a musical atmosphere. The formal side of the work is made as melodious as possible, and all technical exercises are clothed in harmony. The children have weekly opportunity of hearing a short program of music by the best composers, performed by friends of the school, by teachers, or by pupils prepared through outside work. The older children have heard short and simple talks on the lives and work of the great masters, illustrated by piano and vocal selections. A large part of each period of work is spent in song-singing. The school has been divided into two choruses, one ranging from six to eight and a half years of age, the other from nine to thirteen. These choruses have sung melodies learned by rote in their group work, the older chorus having in its repertoire songs by Franz Schumann, Wagner, Reinecke, Humperdinck, and some of the best English composers. In connection with their work in Latin, they have learned a Latin song of nine stanzas and a shorter Christmas hymn; in connection with French, several *chansons populaires* and two old French rounds. The latter, being very simple in melody, have furnished a valuable exercise in concentration. There being in this chorus a considerable proportion of children unable to sing a connected melody correctly, perfection in detail is impossible. The special aims, other than familiarity with good songs and the memorizing of texts, have been bodily poise, deep breathing, careful enunciation, and a pure quality of tone. A picked chorus of twenty-five voices is now being arranged which will be

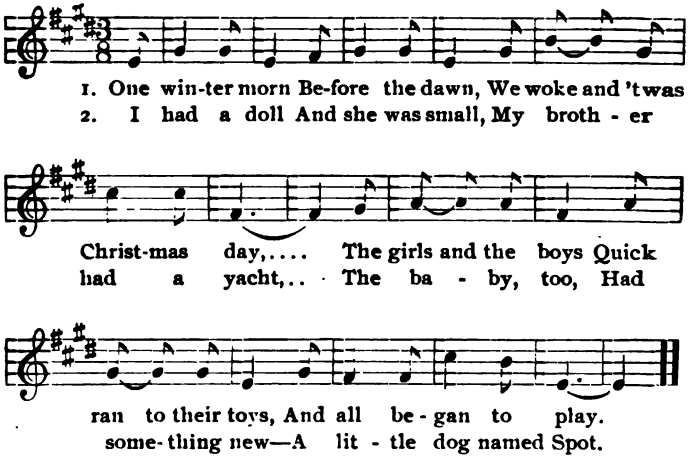
trained to do some model singing for the benefit of the school.

Owing to the wide differences in musical development, it was difficult to find a common ground for the work of each group as a whole. The technical work founded on short, original phrases sometimes failed to arouse interest in those children who but imperfectly grasped melodic idea. The proposition, however, to select a topic and write a complete composite song, which should express the genius of the group, brought a unity of impulse at once. It was supposed that the unmusical children would devote themselves to the text and leave the musical setting to the rest. But not so; the general enthusiasm awoke them to an overflow of musical ideas, and a firm belief in their own phrase as given. Whatever of novelty the songs possess is owing to the odd intervals offered by these non-musical children. It was necessary to harmonize them attractively to gain their acceptance by the musical members of the group, who, left to themselves, would have given only the most obvious phrases and thus produced more commonplace results.

After several successful songs had been composed, a group of children between seven and eight years, below the average in musical development, but having a strong feeling for rhythm, wrote the following, which is saved from monotony by the final phrase given by a boy almost tone-deaf. He offered the phrase, which was repeated on the piano as nearly as possible as he had given it. He objected, however, saying what was played was not what he intended to give. After repeated attempts, the teacher succeeded in discovering what he had persistently kept in his mind, but could not express.

CHRISTMAS MORNING

Autumn '98.


1. One win-ter morn Be-fore the dawn, We woke and 'twas
2. I had a doll And she was small, My broth - er
Christ-mas day,.... The girls and the boys Quick
had a yacht,.. The ba - by, too, Had
ran to their toys, And all be - gan to play.
some-thing new—A lit - tle dog named Spot.

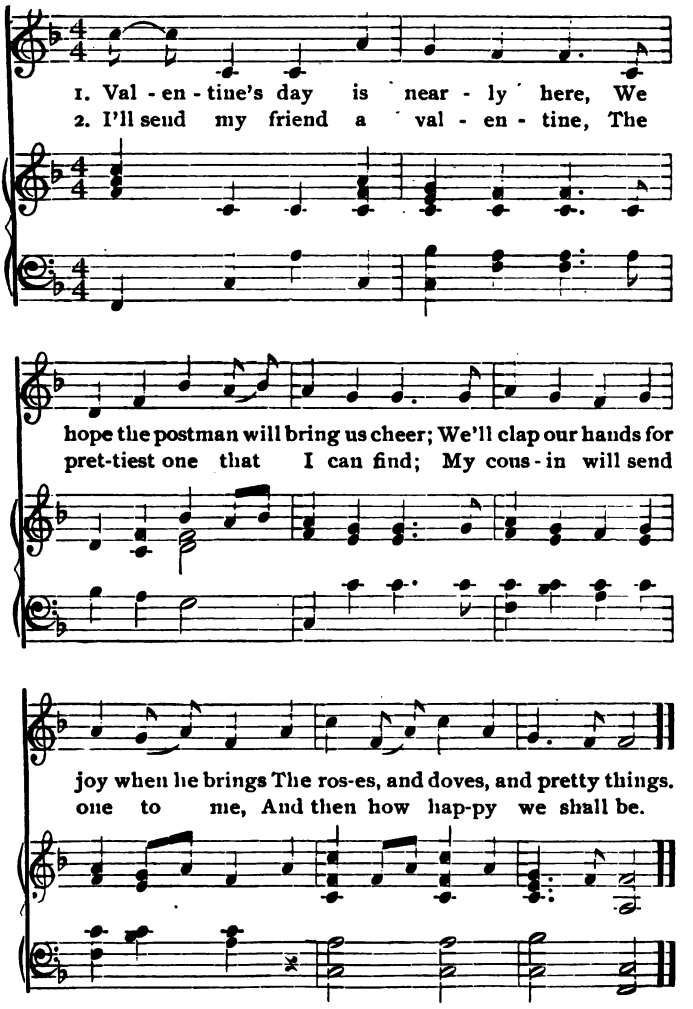
It was at first thought that the six-year-old children were too young to carry a thought through the several periods (occurring but twice a week) required to finish a song. At their request, however, they were allowed to undertake the task, and evinced as much continuity of thought and purpose as the older children.

In writing the texts for songs, the youngest children, as soon as the idea of rhythm and rime is gained, insist upon making consecutive lines rime as in the "Valentine Song." They free themselves gradually from rime limitations, as:

"The children will go
Out in the snow
And have some jolly fun.
They 'll make big balls
While the snow falls,
Until a snowman's done."

VALENTINE SONG

Winter '99.

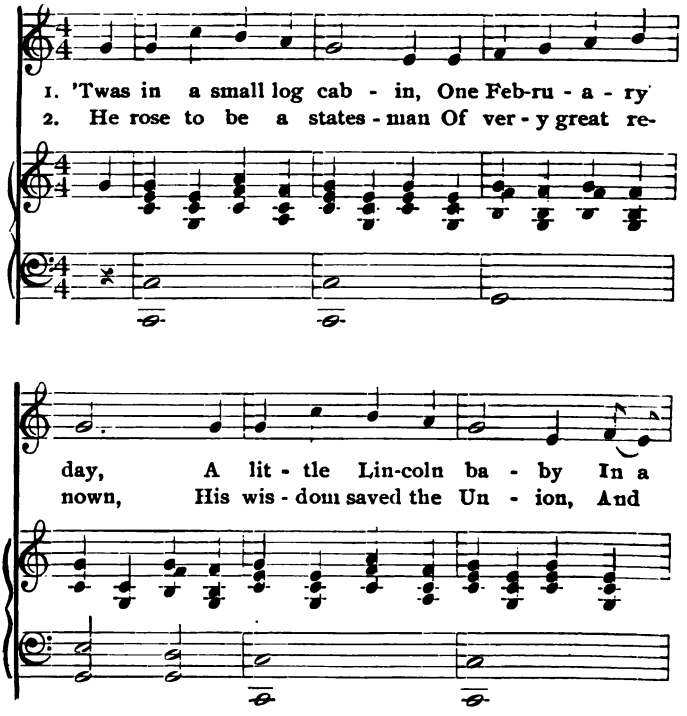
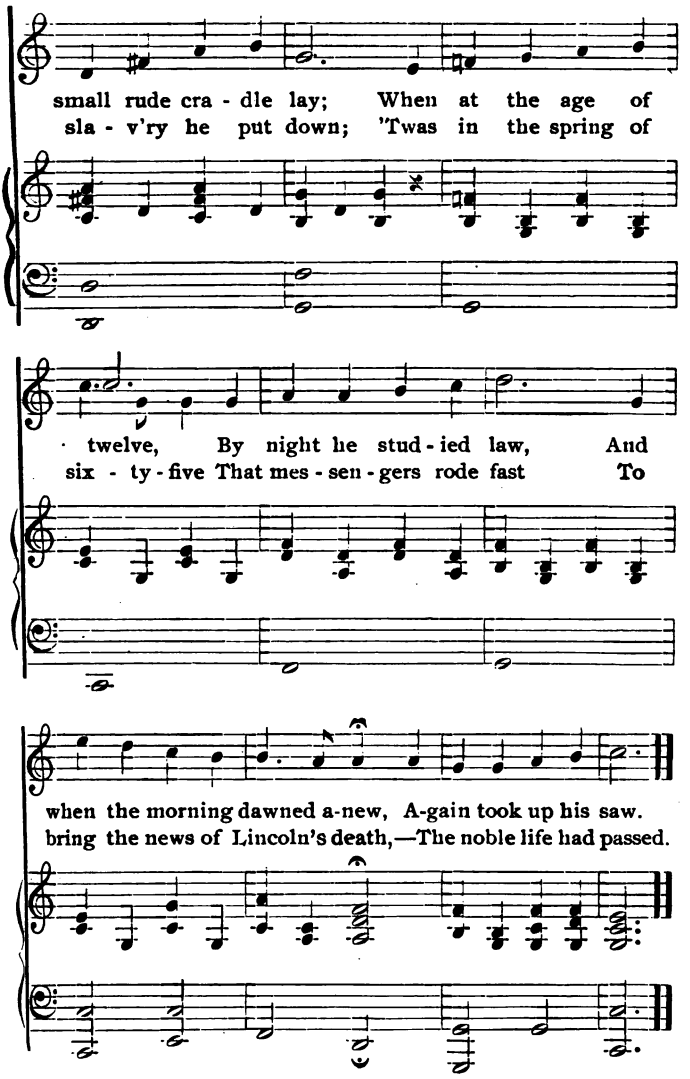

1. Val - en - tine's day is near - ly here, We
2. I'll send my friend a val - en - tine, The
hope the postman will bring us cheer; We'll clap our hands for
pret-tiest one that I can find; My cous - in will send
joy when he brings The ros-es, and doves, and pretty things.
one to me, And then how hap-py we shall be.

And finally, able to conceive of the stanza as a whole, they realize that only a minimum of rime is necessary.

The twelve-year-old children completed two lines of a stanza for a winter song, but the effort was then abandoned, there being too much self-consciousness in the group to admit of free expression. Later their creative impulse triumphed, and they produced a song for Lincoln's birthday:

LINCOLN

Winter '99.


1. 'Twas in a small log cab - in, One Feb-ru - a - ry
2. He rose to be a states - man Of ver - y great re-
day, A lit - tle Lin-coln ba - by In a
nown, His wis - dom saved the Un - ion, And

small rude cra - dle lay; When at the age of
sla - v'ry he put down; 'Twas in the spring of
twelve, By night he stud - ied law, And
six - ty - five That mes - sen - gers rode fast To
when the morning dawned a-new, A-gain took up his saw.
bring the news of Lincoln's death,—The noble life had passed.

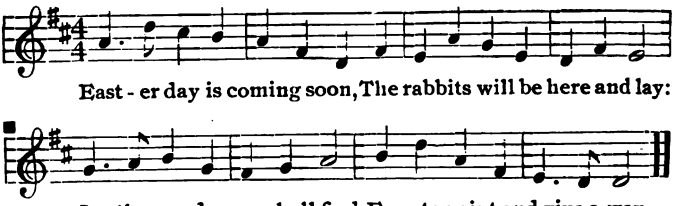
The eight-year-old children followed the song on Lincoln with a song on Washington.

Both of these songs have been sung by the younger chorus at the respective anniversaries for two years, and are asked for at other times. It would be difficult to find songs written by adults which would appeal to the younger children's minds and hearts as do these, in spite of their crudities. The simplicity of thought and expression in the text, the sweetness and vitality of the melodies, exactly suit their needs. Practical trial for over a year has shown their preference for some of these school songs to the best child songs written by adults that have been presented to them. This applies to children from six to nine years of age—a time when they are not ready for involved idea or melody, and yet resent singing about what little dewdrop felt or little pussy willow said. . . .

As Easter approached, the six-year-old children, filled with anticipation of the day, asked to write a song about it. One child gave the first line with its melody; others quickly followed with the second and third lines. The fourth, however, required persistent effort before the requirements of rhythm and rime were met. The children showed no diminution of interest in wrestling with the problem.

EASTER SONG

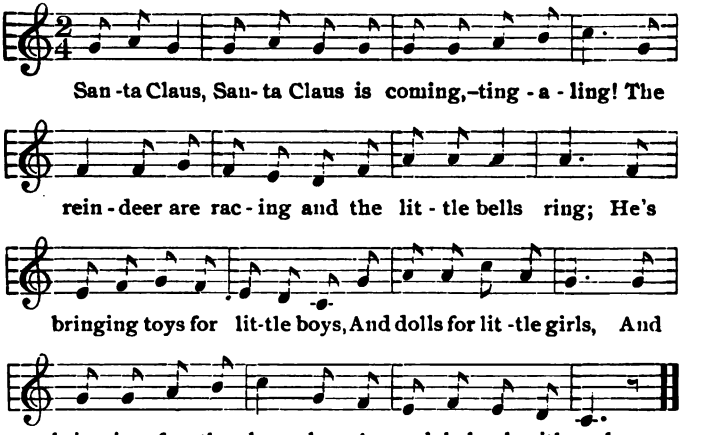
Winter, '99.



Attempts made by the youngest classes of this school year have resulted equally well:

SANTA CLAUS[1]

Autumn '99.

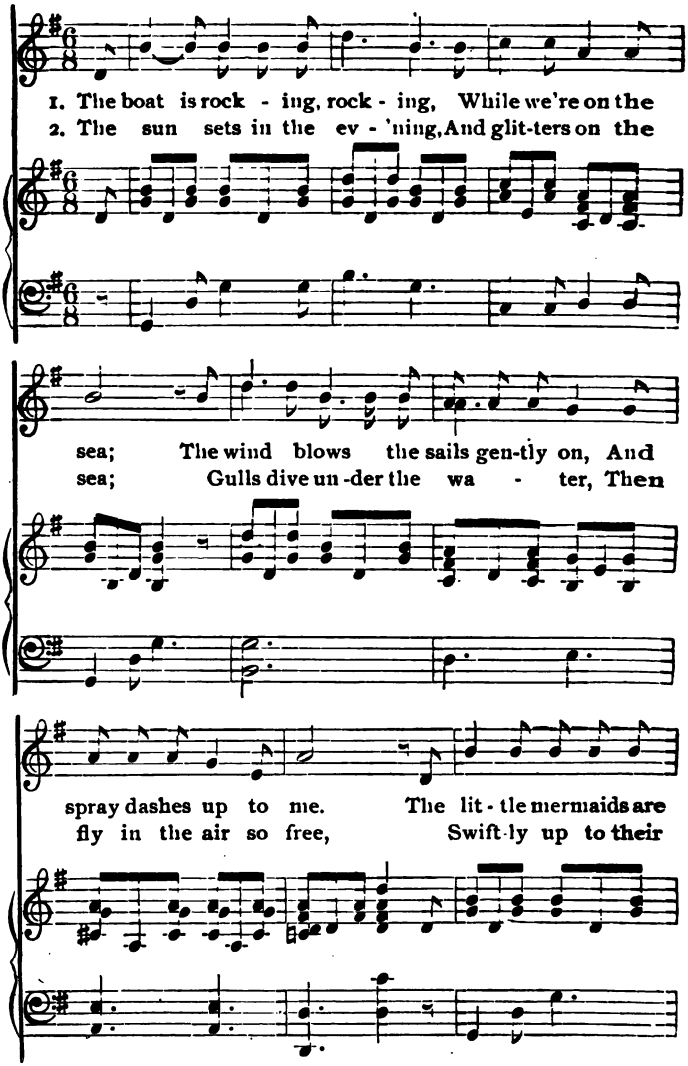
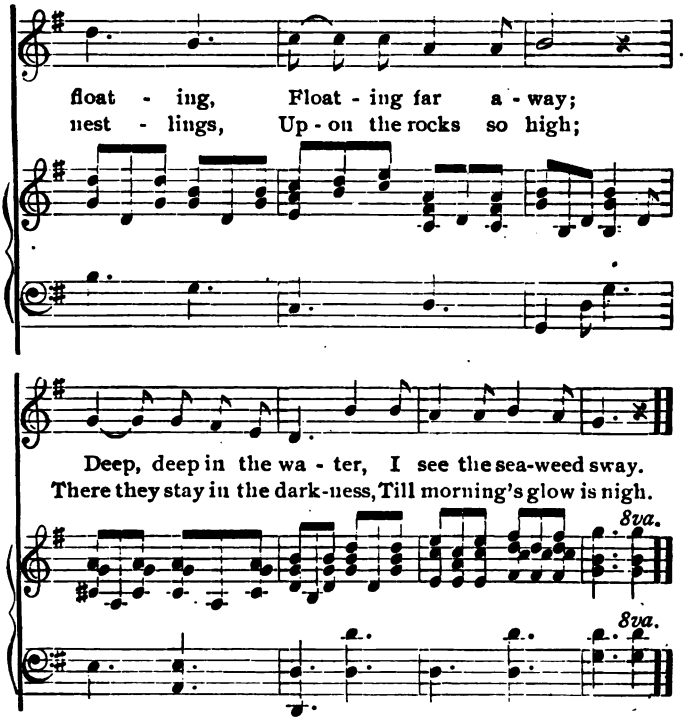

San-ta Claus, San-ta Claus is coming,-ting-a-ling! The
rein-deer are rac-ing and the lit-tle bells ring; He's
bringing toys for lit-tle boys, And dolls for lit-tle girls, And
bring-ing for the ba-by A wool-ly lamb with curls.

The group composed entirely of musically developed children was the last to produce a connected song. The original scheme of work—the study of selected songs with its detail, and the learning of symbols for their own short melodic phrases—contented them. Emulation, however, urged them to write, and they undertook the task as imitators, thus with less exhilaration than the others showed.

Later, a second impulse, more genuine than the first, resulted in one of the best of the school songs:

[1]To musicians these songs are unusually interesting from their close resemblance to early folk songs and narrative ballads, especially to the early German and English folk songs. "Santa Claus," for instance, might be taken intact from an old choral, for its simplicity, its movement, and the feeling for minor in the sixth, seventh, and eighth bars. A. E. T.

Spring '99.

BOAT SONG

1. The boat is rock - ing, rock - ing, While we're on the
2. The sun sets in the ev - 'ning, And glit-ters on the
sea; The wind blows the sails gen-tly on, And
sea; Gulls dive un-der the wa - ter, Then
spray dashes up to me. The lit - tle mermaids are
fly in the air so free, Swift-ly up to their

float - ing, Float - ing far a - way;
nest - lings, Up - on the rocks so high;
Deep, deep in the wa - ter, I see the sea-weed sway.
There they stay in the dark-ness, Till morning's glow is nigh.
8va.
8va.

Composition work with the children has value in proportion to its being an untrammeled expression of their own musical consciousness. The teacher's task is to encourage through beautifying the child's thought by harmonic background. A stenographic report of the process of writing the text for a song by a group eleven years of age is an illustration of the method of procedure:

The following three lines had been made the week before:

The icicles hang from the windows high,
And the wind goes shrieking and howling by;
The bright moonlight shines down on the snow,

Some one wanted an adjective for snow and suggested "glittering," which was objected to on account of rhythm.

And one little rabbit goes jumping below,

was suggested for the last line. Some of the children objected to having the rabbit, saying that it was such a cold night, he would not be out, and suggested instead:

And hunters through the woods do go.

Another child suggested that the hunters would not be out at night; another insisted that that would be just the time they would be returning from a deer hunt. Some one wanted:

And hunters walking about below.

Another suggested substituting "Indians" for "hunters." Another suggestion was:

No flowers are blooming down below.

From time to time the teacher re-read the lines, so that they could get the rhythm, and, after a while, none of the lines suggested after the first being regarded as equal to the first, they went back to that. "Little," "lonely," "hopping," and "father" were suggested as describing the rabbit. "Lonely" was finally accepted as best suited to the verse. "Hunting" was substituted for "jumping," as more suggestive, and the line as finally accepted read:

And one lonely rabbit goes hunting below.

The teacher suggested that, as the first verse was about night, the second be about the day.

Some of the children wanted a chorus. The teacher suggested that this was not a jolly song, so that it did not lend itself easily to a chorus; but if one appropriate could be thought up, it could be used. None could be

thought of at the time, so the second verse was begun.

The first line suggested was:

As the day grows near and the night grows far.

"Comes," and finally "draws," was suggested in place of "grows," and "passes" in place of "grows far." "Passes away" was objected to on account of the number of syllables.

The teacher suggested that, as they were going from a night verse to a day verse, it would be well to put the night idea first. It was then given:

As the night disappears and the day draws near.

The next line was at once suggested:

Again the cheerful birds we hear.

The next two lines were suggested as:

Jumping about on the fleecy snow,
Hopping around do the snow birds go.

One of the children suggested that the snow birds are about a house, and she wanted the song about a lonely place on the mountains. The last two lines were objected to on the ground that birds had just been mentioned. The child who proposed the line said she was simply telling what the birds did. Then this was opposed on the ground that in the first verse the rabbit had been doing about the same thing.

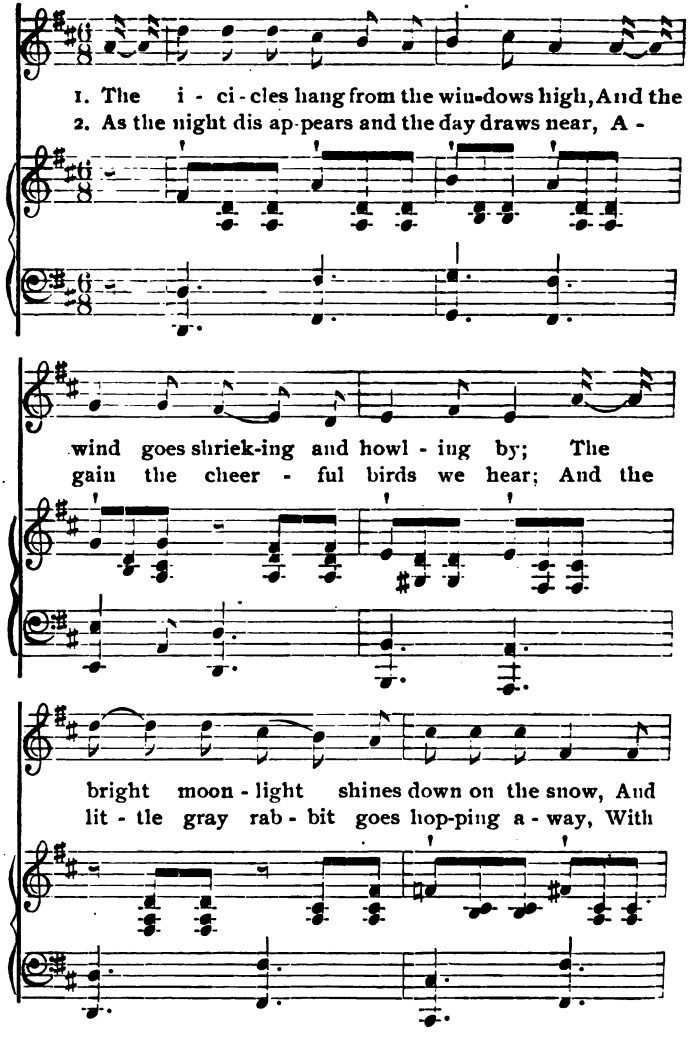
The teacher suggested that they refer again to the rabbit and tell what became of him in the day.

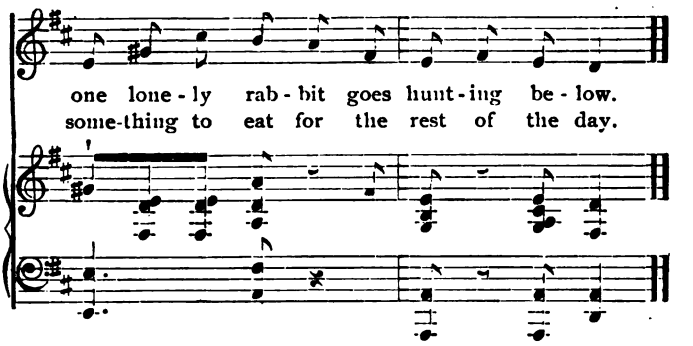
And the same little rabbit goes hopping away,
For he's found something to feed him that day,

was suggested. "Same" was objected to, "little" suggested in its place, and finally "gray" accepted. "For" objected to, and "because" rejected, and finally "with" accepted. One of the children wanted to suggest "*manger*" for "to eat," saying that French words were often used in a song.

The whole song, as finally accepted, read:

A WINTER SONG

Winter 1900.

1. The i - ci - cles hang from the win-dows high, And the
2. As the night dis ap-pears and the day draws near, A -
wind goes shriek-ing and howl - ing by; The
gain the cheer - ful birds we hear; And the
bright moon - light shines down on the snow, And
lit - tle gray rab - bit goes hop-ping a - way, With



The melody of this song was given without criticism by the four members of the group present, one musical phrase from each child in succession, so that text and song were completed in two half-hour periods. The smaller the group, the less confusion arises from various phrases being given at the same time. To avoid this confusion it was at first attempted to give each child in turn an opportunity to offer a phrase, with the result that none were offered. The work cannot be done under formal restrictions.

As no record has been kept of rejected phrases in the process of writing a song, only the method of procedure can be given here.

After the children have selected their topic and written their text, a musical setting for the first line is called for. A quick response usually follows. If several phrases are given, the children choose their favorite. The second phrase, suggested by the first, follows readily. The third usually presents more difficulty. It is unconsciously realized that this in a four-phrase song gives the character to the whole and should contain a climax, and it is criticized and labored over, sometimes during several periods. The final phrase is usually an obvious one; the readiest

child gives it, and others remark it is just what they were going to offer. Originality in a final phrase—as in the Winter Song—is greeted with enthusiasm.

That composition work gives the children a grasp of rhythm is shown by the way they handle it in making their songs effective. A seven-year-group completed a Snowman Song in 3-pulse measure rhythm and sang it to the school. Later they felt that its flowing rhythm was not suited to the requirements of the words, and found by experiment that by using the more energetic 4-pulse the character of their melody became what was desired.

The twelve-year-old children after completing their rollicking Fourth of July song experienced a reaction. They felt they had not expressed their highest musical consciousness, and wished at once to begin a song into which they would put their best effort. As the Fourth of July song had met with enthusiastic approval from the school, this impulse showed a normal growth and as such was encouraged. That it was genuine was proved by the children's slow and critical work, lasting through the remainder of the spring quarter, resumed after the summer vacation, and carried on through more than one half of the autumn quarter. They suggested and directed the piano accompaniment at important points, and, after the song was completed and sung to the school, further embellished it by adding a second-voice part

No claim is made that these are productions of genius, any more than the average child's drawings are. The point is that they compare favorably with his drawings, and even with many school songs. Above all, they, like all constructive work, cultivate the appreciation of the details and beauties of a piece that can never be reached simply by singing other people's productions.

To discuss the various methods of teaching singing in school and out, the songs for children, and so on, is a task for the specialist in music. We cannot, however, omit Dr. Hall's plea for less technique in public-school work and far more singing of songs, with something of the historical setting of each song in order to rouse enthusiasm for it. Very few children will have much use for singing by note, but all of them ought to know the national songs and certain great hymns, love songs and lyrics, and folk songs, together with the setting which has made them significant in the national life.

REFERENCES

Aikin, Wm. A. *The Voice.* Macmillan, 1900, 102 pp.
Barrett, Jean N. Popular Songs of the Day. *Kgn. Rev.*, 1908, 424-5.
Behnke and Browne. *The Child's Voice.* Chicago, 1885, 109 pp. *Voice, Song and Speech.* Lond., 1904, 248 pp.
Bierbower, Austin. Are we Making too Much of Music? *Ed.*, 1908, 361-363.
Bingham, W. V. Vocal Functions. *Psy. Bul.*, 1911, Vol. VIII, 317-320.
Bolton, T. L. Rhythm. *Am. Jour. Psy.*, 1894, Vol. VI, 145-238.
Brittain, H. L. Music and Morality. *Int. Jour. Ethics*, Vol. XIV, 1904, 48-63.
Brower, Josephine (ed.). *Morris Dances.* Gray, N. Y., 1909, 32 pp.
Bücher, E. *Arbeit und Rhythmus.* Teubner, Leipzig, 1909, 490 pp.
Burke, Thomas. Child Songs and Melodies. *Child*, 1911, 687-692.
Cady, Calvin B. Exigencies and Possibilities of Secondary School Music. *Proc. Mus. Teach. Nat. Assn.*, 1908, 148-164.
Campbell, M. R. The Musical Faculty of Feeble-Minded Children. *Child Study*, 1899-1900, Vol. V, 29-36.
Carpenter, Estelle. Vitalizing of Child through Song. *Proc. N. E. A.*, 1907, 856-862.
Chamberlain, A. F. *The Child.* Scribner's, N. Y., 1906, 175-183.
Clark, J. Music in the High School. *Proc. N. E. A.*, 1907, 862-865.
Cooke, J. W. Music Instruction in Public Schools. *Proc. N. E. A.*, 1910, 822-826.
Crane, Julia E. Mistakes of the Music Teacher. *Proc. N. E. A.*, 1911, 794-802.

Dancing, Folk. Bibliography in *Proceedings of Third Playground Congress*, 1909, 307-313.

Dewey, John. Psychology, Rhythm, 185-187.

Music. *Ele. Sch. Rec.*, No. 2, U. of Chicago Press. $o. 17.

Downey, June E. A Musical Experiment. *Am. Jour. Psy.*, Oct. 1897, Vol. IX, 63-69.

Fairweather, E. K. Psychological and Ethical Value of Music. *Proc. N. E. A.*, 1902, 621-625.

Farnsworth, C. H. *Education Through Music.* Am. Book Co., N. Y., 1909, 208 pp.

Teaching of Elementary Music. *Teacher's College Record*, 1904, Vol. V, 1-57.

Fentress, L. L. Worth of Music in Education. *Ed.*, 1908, 646-650.

Fletcher, A. C. *Indian Story and Song from North America.* Small, Maynard & Co., Boston, 1906, 126 pp.

Foresman, Robert. Essential Characteristics of Music. *Jour. of Ed.*, 1907, 97-102.

Frere, M. C. Temple. Musical Rhythm and the Child. *The Child*, Lond., Feb. 1913, 432-437.

Gates, Fanny B. Musical Interests of Children. *Jour. of Ped.*, Oct. 1898, 20 pp.

Gilbert, J. A. Experiments on the Musical Sensitiveness of School Children. *Yale Psy. Lab. Studies*, 1893, 80-87.

Gilman, Benj. I. Experimental Tests of Musical Expressiveness. *Am. Jour. Psy.*, 1892, Vol. IV, 558-576; Vol. V, 42-73.

Goodlander, Mabel R. Primitive Songs and Dances: A Second Grade Assembly. *Ele. Sch. Teach.*, 1908, 65-69.

Gulick, Luther. *Heathful Art of Dancing.* Doubleday, Page and Co., 1910, 273 pp.

Gurney, Ed. *The Power of Sound.* Lond., 1880. Appendix B, 547-549.

Hall, G. Stanley. Chapter on Pedagogy of Music. *Problems of Education*, Vol. I, 91-136.

Chapter on Dancing and Pantomime. *Problems of Education*, Vol. I, 42-91.

Harris, T. J. Reports of over 1,600 cases tested with the Hartmann series of tuning forks. *Arch. Otol.*, 1897, Vol. XXVI, 1-25.

Hill, Cecilia. Children's World of Song. *Parents' Rev.*, Vol. XXIII, 1912, 762-768.

Hofer, Mari Ruef. Music in Kindergarten. *Proc. N. E. A.*, 1911, 479-489.

The Defining of Music in Relation to its Expressive Use. *Teacher's College Record*, 1904, Vol. V, 57-102.

Educational Use of Music for Children under the Age of Seven Years. *Proc. N. E. A.*, 1900, 397-402.

Howard, Frances E. *The Child Voice in Singing*. Novello, Ewer and Co., N. Y., 1898, 138 pp.

Hughes, Percy. Method of Testing Relative Pitch. *Psy. Rev.*, Nov. 1902, Vol. IX, 603-609.

Ingham, C. B. Eurhythmics of Jaques Dalcroze. *Child*, Jan. 1913, 303-313.

Johnson, Martha E. Music and Physical Education. *Proc. N. E. A.*, 1907, 940-942.

Kratz, H. Study in Musical Interpretation. *Proc. N. E. A.*, 1900, 21-28.

MacDougal, Robert. The Structure of Simple Rhythm Forms. *Psy. Rev.*, No. 7, Jan. 1903, 309-412.

The Affective Quality of Auditory Rhythm in Its Relation to Objective Forms. *Psy. Rev.*, 1903, Vol. X, 15-36.

Music Imagery. *Psy. Rev.*, Vol. V, 463-476. (Account of a personal experience.)

Marsh, Florence. Musical Phases of Child Study. *Proc. N. E. A.*, 1896, 891-892. (Abstract of Hall and Marsh's *Early Musical Manifestations*.)

Mason, D. G. Dissonance and Evil. *Atlantic Mo.*, 1904, 226-232.

Mathews, W. S. B. Music as Discipline and Culture. *Music*, Vol. VI, 349-365.

Meyer, Max. How a Musical Education Should Be Acquired. *Ped. Sem.*, 1900, 124-131. (Account of Hooker's method.)

Mills, Wesley. *Voice Production in Speaking and Singing*. Phila. and Lond., 1906, 282 pp.

Miyake, I. Researches on Rhythmic Action. *Yale Psy. Lab. Studies*, 1902, Vol. X, 1-49.

Monroe, W. S. Counting Out Rhymes of Children. *Am. Anthrop.*, 1904, Vol. VI, 46-50.

Tone Perception and Music Interest of Young Children. *Ped. Sem.*, 1903, Vol. X, 144-146.

Mott, F. W. *Brain and the Voice in Speech and Song*. Harper, 1910, 112 pp.

Myers, C. S. A Study of Rhythm in Primitive Music. *Brit. Jour. Psy.*, 1905, Vol. I, 397-406.

Oldys, H. W. Parallel Growth of Bird and Human Music. *Harper's Mag.*, 1902, Vol. CV, 474-478.

Phillips, Paul C. Eurhythmics of J. Dalcroze. *Am. Phys. Ed. Rev.*, Mar. 1913, 142-146.

Platt, W. *Child Music.* Simpkin Marshall, Lond., 1905, 37 pp.

Regal, M. L. The Study of the Appreciation of Music in the High School of Springfield, Mass. *Proc. N. E. A.*, 1910, 803-808.

Sabine, W. C. Melody and the Origin of the Musical Scale, *Science*, 1908, Vol. XXVII, 841-847.

Salter, S. Values in Vocal Music. *Mus. Teach. Nat. Assn.*, 1907. 164-172.

Scott, W. E. D. The Inheritance of Song in Passerine Birds. *Science*, 1904, Vol. XIX, 957-959.

Sears, C. H. Studies in Rhythm. *Ped. Sem.*, 1901, Vol. VIII, 3-44.

Psychology of Rhythm. *Am. Jour. Psy.*, Jan. 1902, 28-61.

Seashore, C. E. Suggestion for Tests on School Children. *Ed. Rev.*, 1901, Vol. XXII, 69-82.

Seashore, C. E., and Jenner, E. A. Training the Voice by the Aid of the Eye in Singing. *Jour. Ed. Psy.*, 1910, Vol. I, 311-320.

Sharp, C. J. *English Folk-Song.* Lond., 1907, 143 pp.

Sharp, Cecil. Music and Folk-songs in Elementary Schools. *Child Life*, 1906, 79-83.

Smith, Margaret K. Rhythmus und Arbeit. *Phil. Studien*, 1900, Bd. 16, 197-305.

Squire, C. R. A Genetic Study of Rhythm. *Am. Jour. Psy.*, July 1901, Vol. XII, 492-589.

Taylor, D. C. *Psychology of Singing.* Macmillan, N. Y., 1908, 373 pp.

Triplett and Sanford. Rhythm and Meter. *Am. Jour. Psy.*, 1901, Vol. XII, 361-387.

Uetzel, Wm. A. The School Orchestra. *Jour. of Ed.*, 1909, 153.

Van Broekhoven, J. Music. *Kgn. Mag.*, 1909, June, 309-315; Sept., 5-6.

Wallaschek, R. *Primitive Music.* Longmans, Lond., 1893, 289 pp.

Weld, H. P. An Interpretative Study of Musical Enjoyment. *Clark College Monthly*, 1911, Vol. I, 216-219.

The Mechanism of the Voice and Its Hygiene. *Ped. Sem.*, 1910, Vol. XVII, 143-159.

White, R. T. Music in the Kindergarten Child. *Child Life*, 1910, Vol. XII, 207-210.

For additional references on Dancing, *see* the chapter on Social Aspects of Education.

CHAPTER XIX

Drawing

1. Before reading this chapter, draw the story of Goldilocks and the Three Bears. Then compare with the pictures and descriptions given in the chapter. **Observations**

2. Make a collection of drawings of the story of Goldilocks. Observe these precautions:

(1) Tell the story to the children just before they draw, so that it will be vividly present to their minds.

(2) Give them as much choice in the material for drawing as possible — crayon, black and colored pencil, paints, large and small sheets of paper.

(3) Give them as much *time* as they want, but have the pictures finished at one sitting.

(4) In the case of little children, label at the time any ambiguous objects.

3. Make a collection of children's spontaneous drawings, especially of the very first ones made by the child of eighteen months or so. Note how much encouragement the child received, and how much criticism and instruction.

4. Keep a dated record of the child's likes and dislikes of colors and bright objects.

As far back as we can penetrate, ancient peoples always had a love for bright objects, or for rare or curious things, and always loved to decorate themselves. Among savage people of to-day there are the same desires. Many motives unite to strengthen these feelings, such as the desire for admiration from the opposite sex, and the instinct of property; **Love for beauty universal**

but there seems also to be a spontaneous love for bright and glittering things, that is the germ of the æsthetic sense.

What the origin of artistic creation or expression was is still much disputed. It is so divorced from practical values, so apart from everyday life, that many have considered it a sort of excrescence that cannot be explained by natural laws. It seems most reasonable, however, to suppose that it was at first the occupation of an idle hour when the primitive man's supply of food was abundant, when he had rested, and when his mind recalled in thought the previous experiences of the chase or of war. Then, in the song and the dance, he reproduced the catching and killing of the prey; or with a sharp stone drew them upon his hunting knife.

Both of these interests appear in little children; they love to hoard up bright things and to deck themselves with them; they reproduce in play and sometimes in drawing their own experiences, although this first drama, song, or drawing is crude, and the love for it often intermittent. To trace the character of the growth of these interests is our present object.

The subject of children's artistic sense includes properly drawing, painting, modeling, music, and story-telling. Only drawing and music can be considered here, with occasional references to the other branches of art, and it should be understood that it is impossible to ascertain what the child's development would be if he were entirely free from adult influences.

The subject of drawing falls naturally into two chief divisions, (1) appreciation and (2) construction. Under the first we shall also include the various observations on the color sense of children.

In testing the color sense it is necessary not to confuse

the child's lack of a color name with inability to discriminate the color or shade. Tests in which the selection depends upon the use of color terms, either by the teacher or the child, are therefore open to some question, and we will omit them here, as there are numerous others. Baldwin's tests upon his child have stimulated various observers to similar tests, using all colors and paying great attention to the luminosity. The most extensive tests are those by Holden and Bosse upon two hundred children. They placed square colored papers on a gray background, and before beginning the experiment, made picking up papers a kind of game, to give practice. The tests proper showed that before the sixth month few children reacted to any color, but in the seventh and eighth months most of them reacted to red, orange, and yellow. At nine months there was a slow reaction in some cases to green, blue, and violet, and by ten or twelve months often an equal reaction to all colors. In another test ribbons of the six spectral colors were laid out, and the order in which they were chosen was noted with babies from seven to twenty-four months old. It was the same — red, orange, yellow, green, blue, violet. With three- and four-year-old children blue was the preferred color, and from four to eight years this preference increased until at eight it was preferred by nearly all. The red end, that is, is nearly always preferred up to two years, but scarcely ever at four; the blue end is preferred by one third of the three-year-olds, and increases steadily to thirteen years. Schuyten's tests on 4,242 four- to nine-year-old school children do not show any such predominance of one end. He used squares of spectral colors, and found the following percentages of favorite colors, indicated by the children pointing to the one they liked best. Four- to nine-year-old boys: red, 26.2; violet, 20.7; blue,

16.1; yellow, 14.2; orange, 7.6; green, 5.7; black, 4.8; white, 4.1. For girls the first four came in the same order as for the boys, and then green, orange, black, and white. For the ten- to fifteen-year-old boys the order was blue, red, violet, yellow, green, black, orange, white; for the girls, blue, red, violet, green, yellow, black, white, orange.

Engelsperger and Ziegler tested two hundred six-year-old children by the matching method, and found the following order of frequency in discriminating: orange, 99 per cent; lilac, purple, and rose, 97 per cent; violet, 96 per cent; bright blue, 92 per cent; dark blue and blue green, 91 per cent; dark yellow, 88 per cent; green blue, 85 per cent; dark red and bright yellow, 76 per cent; dark gray, 75 per cent; light gray, 74 per cent; light yellow, 70 per cent; dark and light brown, 68 per cent; dark and light green, 67 per cent; light red, 64 per cent; scarlet red, 57 per cent. When colored objects were used instead of paper squares, about the same results were obtained. In still another test color preferences were called for and were found to be much the same for boys and girls, as follows: lilac, purple, 20 per cent; dark blue, 17 per cent; violet, 15 per cent; bright yellow and orange, 8 per cent each; light blue, yellow, green, dark red, and white, 5 per cent each; scarlet, 4 per cent. Their color aversions were as follows for boys: black, 48 per cent, then light gray, light brown, dark gray, dark red, rose, dark brown, and white. Jastrow collected data at the Chicago Fair as to favorite colors of adults, and found that blue was the favorite for men, and red for women, with blue a close second (forty-five hundred records in all).

Miss Shinn summarizes the data on the color sense of the first three years thus: for several months after birth the child is probably insensitive to color; during the second six months color sensations are felt, beginning

with the red end of the spectrum and progressing to the violet end, with positive proof that all of them are perceived before the eighteenth month. By the third year the child has all the color perceptions of the adult and can learn their names, but probably has no feeling for color harmonies. At this age the "cold" colors may be as well liked as the "warm" ones.

Sully thinks that the love of flowers is the nearest approach of the child to pure æsthetic enjoyment, although different qualities attract different children. With some the enjoyment is almost entirely one of smell; with others, a love of personal adornment. It seems to be much the same with very small boys and girls, but later the boys learn to despise their leanings toward such things.

In all this, the child follows, in the main, the race development: bright or gaudy colors before delicate ones, and the utilitarian value of objects before the æsthetic. This appears again in the fact that few children care about landscape beauty. The sublimity of mountain or of sea arouses only fear, and the beautiful and lovely are lost in the child's interest in some detail that appeals to him.

Love of pictures

At first the baby acts like an animal with regard to representation of objects. He thinks the reflection in the glass is a real thing, as the animal does the well-painted picture, and as the savage thinks that his reflection in the water is his spirit-double.

At a very early age, even as early as eight months, some children learn to recognize pictures, and they react to them as to realities. The discrimination in such cases may be quite fine. Miss Shinn's niece, when fourteen months old, picked her father out of a group of nine, although the face was scarcely more than one-fourth of an inch in diameter. This recognition, however, is a

very different thing from recognizing the picture as a picture, that is, as a symbol or copy only, of no use in itself. Children do not learn this nearly as readily. Even at four years we sometimes see them trying to feed the picture. One boy at this age saw a picture of people going to church. The next day on seeing it he exclaimed in surprise because they were not yet there. Miss Shinn's niece, at the age of three, saw a picture of a chamois defending her kid from an eagle, and put her hand between them to defend the kid. At the age of two she tried to lift the painted branch that lay across a lamb in a picture.

We see the same thing in the tendency to consider a drama as a reality, in the confusing of the make-believe Santa Claus with the real one, and so on. Only by slow degrees does the child learn to take one object as representing another, and as having no value in itself. The use of symbols seems to be an acquired power, not a natural one, and at first there is confusion of the symbol with the reality for which it stands, in proportion as the feeling is strong. We see this illustrated again and again in adult life, in religious observances.

Children's preferences

Whether children at any given age recognize clearly the difference between the picture and the object or not, their likes are interesting to us from the standpoint of schoolroom decorations. Dr. O'Shea's observations, at first glance, are rather discouraging. He found that the children, as a rule, cared nothing for the reproductions of classics. Colored pictures, even the crudest chromos, and "cunning" pictures —little children and animals playing—were always chosen, except when Santa Claus or the Mother and Child were present. In many cases when asked what pictures were in their schoolrooms the children would be able to name only one or two out of a large number. The others,

apparently, had made no impression upon them. They were over their heads figuratively as well as literally. If this be true of children generally, the problem of schoolroom decoration is hardly as simple as many people think.

We are wont to assume that, given the money and a knowledge of classical painting and sculpture, a perfectly equipped school will result. I have been in several schools that to the adult eye are wonderfully artistic in their decorations, considering the scanty means at the teacher's disposal. But how much do the children get out of it? The same question might be asked about many of our kindergarten rooms.

Now, we are not reduced to nothingness if we do pay attention to the children's tastes. There are the Madonnas, and the many beautiful pictures of little children. In animal life the paintings of Landseer and Rosa Bonheur make a good beginning, and there are many others. We need not lower our standards of the æsthetic, but simply change our subjects, according to the interests of the children. If this were carefully carried out, the pictures in the eighth-grade room would be quite different in subjects from those of the kindergarten, instead of both reflecting only the teacher's tastes.

A more practical aspect of the liking for pictures is brought out by Mr. Lukens. He says that children are interested especially in pictures that have stories connected with them, and frequently are interested in them only when the story is told. He suggests, accordingly, that the pictures in primers should stimulate the child's curiosity and so arouse a keen desire to learn how to read.

In considering childish creations or inventions, we should properly include much more than their drawings, but we can only touch upon these other things here.

All such forms of activity are very closely related to play, in so far as they are spontaneous, but in the adult, at least, they are distinct from it in that they involve a social aspect not essential to play.

Dewey says that the artist differs from the artisan in that he sees in his work its social value, and sees himself as a medium for the expression of social forces. That is, the shoemaker who appreciates the social possibilities in shoes would become an artist.

The child at first makes no distinction between the fine and the useful arts. Only by degrees does he separate the value to himself from the general value; the useful from the beautiful. His first activities are controlled by his own enjoyment of them and not by any results that are objectively useful to him or to others. This is play par excellence.

Child's love of modeling

Lay made some very interesting observations on twenty-eight boys and twenty-eight girls of six years who had been in school eight weeks. Each was given a piece of clay and told to do whatever he pleased with it. Within ten minutes only the two stupidest children had done nothing. The others were making things, and in an hour they had made eighty-six objects. After an hour of work most of them preferred to stay at their desks modeling to taking recess, and did not begin to show fatigue until they had worked an hour and a half. The objects modeled were such things as an altar, sausage, steamer, hen, elephant, swan, pig, apple, milk can, bed. None seem to have made the human form, and Lay found no relation to the children's picture books. As a rule, the better pupils chose the more difficult objects, but some of the poorer pupils showed unsuspected power in this field.

The most exhaustive study of children's drawings is that of Kerschensteiner. He based his conclusions upon

KINDERGARTEN PICTURES*

Character	*Per cents*	*Character*	*Per cents*	*Character*	*Per cents*
Scenes	15	Series	1	Bears	68
Fragments	81	Houses	75	Girl	69
Interiors	1	Trees	37	Bears and Girl	46

* About one hundred children from each grade were asked to draw the story of Goldilocks and the Three Bears. This series shows the average of each grade.

Plate I

three hundred thousand drawings of fifteen thousand six- to fourteen-year-old children in the Munich schools, chosen at random, and twenty-three hundred children who showed special ability in drawing. These children were all required to make drawings of certain specified persons, objects, and scenes, and to decorate certain objects such as a plate and book cover. His results are in harmony with those in spontaneous drawing and may be very briefly indicated thus: before the seventh year 94 per cent of the children draw what they know rather than what they see, with little reference to proportion; then comes a silhouette stage, positions being selected so that two dimensions can express them; third comes perspective, but few reach this stage without instruction, and barely half can learn it before ten. At first there is complete lack of ability to represent spacial relations and various devices are resorted to, giving maplike effects, turning the paper about, and so on, with, at about the ninth year for boys and the twelfth for girls, some success. Fairly perfect pictures rarely come before the fifteenth year, and then only with the help of copies. Graphic presentations of space are far better done by boys than by girls. Decoration of surfaces seems to be quite distinct from drawing proper, and appears early. After eight years boys and girls differ so markedly that they should have separate classes.

What children draw

When we consider what children spontaneously draw, we have one valuable way of discovering their interests. Actually they seem to draw almost everything that they have ever seen, but certain prominent interests also appear. The observations that have been made give these results: Little children, as a rule, do not draw objects that are before them. Of objects that were absent, 45 per cent

drawn between five and six were human figures, 23 per cent animals, 35 per cent plants and flowers, 32 per cent houses, 40 per cent still life, 5 per cent conventional design, 3 per cent ornamental; between fourteen and seventeen years ornament and design rose to 8 and 37 per cent; human figures made up 5 per cent, animals 10 per cent, plants 11 per cent, and houses 4 per cent. These were drawings made in school, and the same things appear in 1,232 spontaneous drawings. If we put together all the pictures containing human figures, they aggregate nearly three fourths of the entire number. Figures in motion are more commonly drawn than figures at rest, and show greater ease.

Dr. O'Shea's observations also confirm these as regards ornament. He found that children under five never tried to draw the accessories of a figure; 50 per cent of those eight years old tried, and 87 per cent of those sixteen years old. Miss Flanders's observations show the same thing.

Mr. Lukens again presents for our consideration the practical value of such spontaneous drawing. He advocates it as a harmless method of inoculation against real escapades. That is, he appears to think that the boy who draws vividly the various scenes in the life of Daredevil Dick of Coyote Range will have no desire thereafter to run away from home and live out some of the adventures about which he has read. Possibly a good drawing of himself smoking, swearing, etc., will take the place of the reality, and he will escape the temptations of craps and playing for keeps by picturing his defeat in them!

However this may be, there is little doubt that drawing is often a good test of the child's understanding of the words he uses. Doubtless you are familiar with the child's pictorial rendering of "The Old Oaken Bucket" —a circle for the well; three buckets, for the old oaken

FIRST GRADE PICTURE

Character	*Per cents*	*Character*	*Per cents*	*Character*	*Per cents*
Scenes	35	Series	1	Bears	69
Fragments	65	Houses	84	Girl	50
Interiors	1	Trees	55	Bears and Girl	32

SECOND GRADE PICTURE

Character	*Per cents*	*Character*	*Per cents*	*Character*	*Per cents*
Scenes	88	Series	0	Bears	61
Fragments	8	Houses	93	Girl	69
Interiors	2	Trees	65	Bears and Girl	39

bucket, the iron-bound bucket, and the moss-covered bucket; and a number of dots representing the "loved spots that my infancy knew." Again, most sketches of Jack and Jill show them as twin brothers.

In tracing the development of a child's drawing a very neat parallel has been worked out between it and speech, thus:

SPEECH	DRAWING
1. Automatic cries and reflex or impulsive sounds.	1. Automatic and aimless scribble.
2. Imitation of sounds, but without meaning.	2. Scribbling localizations; imitation of movement of hands.
3. Understanding of words without speaking, except such words as names.	3. Same, with only simplest localization of features by scribbling.
4. Repetition of words as mere sounds when said to him (brief stage and of little importance).	4. Copying from others to see how to get right effect in use of lines.
5. Use of words to express his thoughts.	5. Picture writing, illustrated stories, etc.
6. Study of grammar and rhetoric.	6. Study of technique of drawing.

Scribbling

Baldwin's observations on his daughter have been confirmed by later observers, and may be given here as illustrating the development outlined above. Beginning with the nineteenth and extending to the twenty-seventh month, he found that the drawing was only the vaguest imitation of the movement of his hand, no connection being recognized between the hand work and the lines. Helen could identify the copy, but not her own drawing unless she remembered what she had been trying to make. The same drawing would serve for a man or an animal, as she pleased. Sometimes also a child will begin scribbling either aimlessly or with the intention of making some object, and will accidentally happen upon some unexpected form. He will

then adopt this and copy it again and again. For instance, a small boy happened to make curls that looked like smoke, whereupon he exclaimed in glee, "Puff, puff!" and made more. The only development here is in the freedom of movement. The lines change from angular straight lines to curves; instead of running all one way, reverse movements with loops occur, although the lines are almost always horizontal or sloping slightly to the right like ordinary handwriting. As would be expected, the entire arm is used at first, and later the wrist and finger movements.

Copying

In the twenty-seventh month Helen got the idea of making each part of the figure, and from that time there was the attempt to make a copy, to follow an idea or object. She saw the connection between the pencil marks and the thing that she wanted to make, and now directed her attention to the marks instead of to the movements. This is the time when drawing or the representation of an object really begins. Up to this time the use of the pencil has been only a form of exercise; now, it is a new language. It shows one interesting feature in common with language, and that is, that the first drawing tends to stand for all things. Thus Helen first drew a man. Later, in drawing birds she put into her drawing many of the marks which stood for a man.

Draw what they know

In this early work, the children do not appear to copy from the object, even when it is before them. A child told to copy a man lying down, draws him as she draws other men, standing up. She may notice later the discrepancy, but at the time it does not trouble her at all. She draws the object as she knows it, not as she sees it, because the picture is a true language to her. Thus she shows people through the sides of the houses, and all the sides of the house, and the legs of the chair, regardless of the actual appearance.

THIRD GRADE PICTURE

Character	*Per cents*
Scenes	85
Fragments	2
Interiors	3

Character	*Per cents*
Series	8
Houses	86
Trees	85

Character	*Per cents*
Bears	46
Girl	72
Bears and Girl	28

FOURTH GRADE PICTURE

Character	*Per cents*
Scenes	84
Fragments	007
Interiors	12

Character	*Per cents*
Series	3
Houses	86
Trees	83

Character	*Per cents*
Bears	34
Girl	77
Bears and Girl	23

Plate III

A child has little or no technique, and so simplifies many things until the drawing seems to be little more than a symbol of the object; but that it is not symbolic to him is shown by his putting in striking details to identify particular persons or things. He has no sense of proportion or perspective. Men are taller than houses, birds and dogs are of the same size, and all appear in one plane.

Barnes thinks that this lack of unity in the picture is due to the fact that the child thinks in very small units, and fails to look at the picture as a whole. He draws the outside of the house, then, going on with his story, he shows the people doing various things inside the house, forgetting about the outside. It comes out again in the fact that often a child will repeat some detail in the story again and again without seeming to notice the rest. One child drew twenty-six Johnnies in "Johnnie Guck in Die Luft," and nothing else.

Rouma, however, criticizes this position. He says that most children accompany their drawing by a verbal description either to themselves or the onlooker, and that what seem to be gaps in the drawing are filled by the words of the child. A drawing should never be considered apart from the conditions under which it was drawn.

Outlines

Almost without exception, the first pictures are outlines or diagrams, not mass drawings. Whether they are symbolic and conventional, or diagrammatic, is a point of dispute. Sully thinks that they very soon become conventional, that the child adopts a certain outline for man, another for trees, and sticks to it regardless of the various kinds of men and trees that he knows. Lukens, on the other hand, regards this, when it occurs, as a case of arrested development and to be deprecated. If the child is allowed to develop freely, he thinks that there will be a progress in

the production of natural effects. I am inclined to agree with Dr. Lukens on this, and I feel sure that what Professor Sully says is true, that many children are really led into this conventionalism by our very methods of teaching. One mass appearance represents apple trees, another pines; and we teachers frequently do not know enough to appreciate an individual apple tree when the budding Corot gives us one, but condemn him to draw apple trees in general.

Drawing of a man

We have already seen that the object most often chosen by the children is the human figure. Schuyten, Lukens, Levinstein, Barnes and others give the following order of development. In drawing this, children begin with the full view of the head. At first only eyes and mouth are put into it, and the body is a mere jumble of lines. Later, arms and legs are added to the head, and after a time a body appears, but even then the arms may come out of the head for some time. Barnes found that full faces predominated until the age of nine, and then profiles. In the transition stage, the profile may be drawn with two eyes and ears. As we should expect, with right-handed children the profiles and animals face to the left and the child draws the animal from the head back. In the drawing of horses, the observations of Miss Caroline Flanders[1] show these percentages: For first-grade children, six to seven years old, 30 per cent turn to the right, 65 per cent to the left, and 12⅓ per cent to the front; 58 per cent are profile; 12⅓ per cent full face; 25 per cent are ambiguous creatures. (See Diagram 11.) 73 per cent have eyes; 51⅔ per cent,

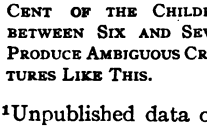


DIAGRAM 11. IN DRAWING A HORSE TWENTY-FIVE PER CENT OF THE CHILDREN BETWEEN SIX AND SEVEN PRODUCE AMBIGUOUS CREATURES LIKE THIS.

[1]Unpublished data on 1,000 Chicago school children from kindergarten through eighth grade.

FIFTH GRADE PICTURE

Character	*Per cents*
Scenes	84
Fragments	0
Interiors	15

Character	*Per cents*
Series	0
Houses	83
Trees	77

Character	*Per cents*
Bears	28
Girl	64
Bears and Girl	9

SIXTH GRADE PICTURE

Character	*Per cents*
Scenes	61
Fragments	20
Interiors	17

Character	*Per cents*
Series	0
Houses	58
Trees	59

Character	*Per cents*
Bears	36
Girl	58
Bears and Girl	22

Plate IV

nose; 60 per cent, mouth; 58 per cent, ears; 85 per cent, tail; 16⅔ per cent, mane; 31⅔ per cent, hair; 96 per cent, legs, varying in number from one to four.

Goldilocks was drawn by the kindergarten children, 22 per cent of the drawings facing left; 13 per cent, front; 36 per cent, right; 7 per cent, back. In the second grade fewer faced front, and more sideways; and in the seventh and eighth grades most faced to the left. Joints were first drawn by fourth-grade children.

Drawing of stories

In the illustrating of stories, Earl Barnes found that freedom in drawing, as shown by the number of scenes, increases up to the age of thirteen, and then decreases to sixteen. All the children who declined to draw were over thirteen. Here again we find the self-consciousness of adolescence, the feeling of inability in the presence of new ideals.

In all cases, the children prefer large, distinct figures, especially for the hero. In the story of Johnnie, the little boy is often made much larger than the men who rescue him. We have a nice analogy here in the Greek custom of representing heroes and gods as larger than ordinary men.

We find a similar case in the exaggerations given to details which are prominent in the child's mind. A pair of glasses will dominate the entire picture; a watch chain will spread over the whole front; vest buttons of heroic proportions will appear, or some characteristic attitude will be represented in its extreme. The child is an unconscious caricaturist. One curious fact here is that the catastrophe is not drawn nearly as often as the scenes just preceding and following it. Earl Barnes lays this to a sense in the children, like that in adults, which leads them to enjoy most the suspense, and afterwards the pleasure of rescuing the lucky hero. It seems that one may fairly question this explanation, though it is difficult to

offer a satisfactory one in its place. We can hardly think the children would consider the catastrophe too difficult. Perhaps it may seem too complicated to attract them.

Experiment with story of Goldilocks

The observations made by Miss Flanders upon one thousand children from four to fifteen years old, who drew the story of Goldilocks and the Three Bears, confirm Professor Barnes's, and add some further interesting details. Many of the drawings were with colored chalks, which the children preferred when given a choice, and with which they drew better than with black and white. In the kindergarten, most of the children use lines instead of mass; a few mass, and a few both. In the first grade, where instruction in drawing begins, the figures are almost equally divided between the two; and beyond the first grade, mass is used nearly always, showing the effect of instruction. This again leads to the conclusion that children naturally draw in line, even when given a medium like crayon, that lends itself to mass; but that they can soon be taught to see and draw in mass.

The effect of the teacher upon the children also comes out very distinctly in these papers. Where the teachers like drawing the children are freer in expression, improve more rapidly, and enjoy the work better.

Development and scenes

The gradual changes in the pictures from kindergarten through eighth-grade drawings are shown in the series running through this chapter. The figures with each picture show the percentage of children in the grade who drew essentially the same picture, and also the variations from it. The remarkable thing about these pictures is their uniformity of scene. Why do the children choose a scene which is really so little connected with the story? Why do they take a landscape instead of an interior?

SEVENTH GRADE PICTURE

Character	*Per cents*	*Character*	*Per cents*	*Character*	*Per cents*
Scenes	45	Series	36	Bears	61
Fragments	9	Houses	70	Girl	73
Interiors	9	Trees	70	Bears and Girl	46

EIGHTH GRADE PICTURE

Character	*Per cents*	*Character*	*Per cents*	*Character*	*Per cents*
Scenes	52	Series	9	Bears	27
Fragments	18	Houses	68	Girl	56
Interiors	20	Trees	64	Bears and Girl	14

Plate V

In the second grade, sky and ground are shown as meeting; before that, with a space between. There were very few *series* of drawings, probably because the children have not been shown how to draw in that way. In the higher grades more detail appears in the drawings. Throughout, the details are copied from what the children see about them—a peculiar style of window; high stair in front of the house; family portraits on the walls. The totals of Miss Flanders's work are seen in the following summary:

All the pictures have houses: 10 per cent in mass; 80 per cent in line; 9 per cent in both; 14 per cent transparent; 5 per cent with doors; 12 per cent with knobs; 2 per cent with door panels; 69 per cent with windows; 6 per cent with curtains; 65 per cent with chimneys; 41 per cent with smoke.

Sixty-eight per cent have trees; 9 per cent in line, 73 per cent in mass, and 16 per cent in both; 34 per cent have forests, and 1 per cent, flowers.

Sky and ground are shown by 65 per cent, ground alone by 15 per cent, and sky alone by less than 1 per cent.

Bears are shown by 47 per cent; with bear shapes 27 per cent, human shape 20 per cent, animal shape 21 per cent. Their faces are: profile 55 per cent, full 23 per cent, double 21 per cent. Of features, 20 per cent have eyes, 45 per cent tails, 9 per cent arms.

Goldilocks is drawn by 66 per cent. She is allowed head, neck, body, skirt, and feet by 3$\frac{1}{7}$ per cent; head, body, and feet by 5$\frac{5}{7}$ per cent; head, skirt, and feet by 10$\frac{1}{7}$ per cent; head, body, skirt, and feet by 68$\frac{5}{7}$ per cent; head and skirt by only 2$\frac{6}{7}$ per cent; full face in 22$\frac{4}{7}$ per cent; doubtful outlines in 41$\frac{6}{7}$ per cent.

As to features, she is allowed eyes by 23$\frac{5}{7}$ per cent; nose by 21$\frac{1}{7}$ per cent; mouth by 19$\frac{3}{7}$ per cent; ears by

1 per cent, and hair by 47½ per cent; feet by 76 per cent; shoes by 33 per cent; arms by 50 per cent; hands by 9½ per cent; fingers by 5½ per cent.

Certain conclusions are easily reached on the basis of these facts. It is evident that drawing should begin with the human figure as a whole and not with conventional designs, and should only by degrees work up to the analysis involved in the latter. The method of using drawing to illustrate stories, scenes from child life, is to be commended instead of a conventional course in drawing.

Figures vs. conventional designs

Ruskin laments the devotion of the school to geometrical forms. He says: "A great draftsman can, so far as I have observed, draw every line but a straight one. When the child longs to turn out men, dogs, cars, horses, heroes, he is showing his freedom; but he is bidden to draw a straight line, a curve, or the like. When nature intended him to be as yet a player, an artist only, the school seeks to make him a geometrician; when he desires to make many lines, he is confined to one; when he endeavors to produce a whole, it seeks to make him produce parts only. Neither the child nor primitive man begins with a geometric line—it is in a scribble that the history of graphic art lies hid."

These facts would also lead us to conclude that children draw naturally in outline instead of in mass, and that shadow, etc., should be introduced by degrees as the child learns to separate knowledge from sight. It can hardly be said that all these children would use outline naturally if there were not some reason for it. Technique should be introduced slowly. Probably by the age of nine most children will appreciate some help in this direction.

Too often children are simply taught certain technical

tricks, but are not taught to observe, with the result that high-school boys and girls draw no better than those in the third grade. Back of all drill in technique must be the observant and interested mind striving to express an idea. So above all things we must take care not to destroy a child's spontaneous love for drawing by making him self-conscious and distrustful. The ideal thing would be for us all to draw as easily as we write, when it will serve our turn, and there is no reason why we should not if given the proper training.

REFERENCES

Allen, Daphne. *A Child's Visions.* Allen, Lond., 1912, 78 pp. (Spontaneous drawings.)

Amberg, J. D. R. Drawing in General Education. *Ed.*, Vol. XIV, 268.

Bailey, H. T. A First Year in Drawing. Report on Drawing (Industrial) in *58th Ann. Rept. of Mass. Board of Education* (1893 and 1894).

Baldwin, J. Mark. *Mental Development, Methods and Processes,* 50-57, 81-96. Macmillan, N. Y. $3.00.

Balfour, H. *Evolution of Decorative Art.* Rivington, Percival and Co., 1893, 131 pp.

Ballard, B. P. What London Children Like to Draw. *Jour. Exp. Ped.*, Vol. I, 1912, 185-197.

Barnes, E. *Studies in Education. See* Index. U. of Chicago Press, Chicago.

Study of Children's Drawings. *Ped. Sem.*, 1893, 455-463; *Ped. Sem.*, Oct. 1895.

Barrett, H. V. Drawing in Elementary Schools. *Mag. of Art,* Vol. VIII, 326–425.

Brown, E. E. Art in Education. *Proc. N. E. A.*, 1899, 112-121. (Pictures, tragic and comic, for the schools. General.)

Notes on Children's Drawings. *U. of California Studies,* Vol. II, 1897, 75 pp. Bibliog.

Burk, F. L. Genetic versus Logical Order in Drawing. *Ped. Sem.*, 1902, 296-323.

Burnham, W. D. Hygiene of Drawing. *Ped. Sem.*, 1907, 289-304.

Clark, A. B. Child's Attitude toward Perspective Problem. *Barnes's Studies in Ed.*, 283-294. U. of Chicago Press, Chicago.

Clark, J. S. Children's Drawing. *Ed. Rev.*, 1897, Vol. XIII, 76-82.

Cooke, E. Art Teaching and Child Nature. *Jour. of Ed.*, Dec. 1885 and Jan. 1886.

Coole, E. The A B C of Drawing. *Special Rept. of Ed. Dept. of Gr. Brit.* London, 1897.

Dewey, John. *Imagination and Expression — the Psychology of Drawing.* Kgn. Lib. Co., Chicago. $0.15.

Elementary School Record. Number on Art. U. of Chicago Press, Chicago. $0.17.

Fitts, Alice E. Æsthetic Problem in Kindergarten Room. *Kgn. Rev.*, 1909, 600-608.

Fitz, H. G. Freehand Drawing in Education. *Pop. Sc. Mo.*, Oct. 1897, 755-765.

Gallagher, Margaret. Children's Spontaneous Drawings. *N. W. Mo.*, 1897, 130-134.

Haney, J. P. (ed.). *Art Education in the United States.* Am. Art Annual, N. Y., 1908, 432 pp.

Herrick, Mary A. Children's Drawings. *Ped. Sem.*, 1894-6, 338-339.

Hicks, Mary Dana. Color in Public Schools. *Proc. N. E. A.*, 1894, 906-915.

Art in Early Education. *Ped. Sem.*, 1892, 463-466.

Hogan, Louise. Study of a Child. *Harper's Mo.*, June 1898.

Kerschensteiner, G. *Die Entwickelung der zeichnerischen Begabung.* Gerber, Munich, 1905, 508 pp.

Lay, W. A. Die Plastische Kunst des Kindes. *Exp. Päd.*, Bd. 3, 1906, 31-54.

Levinstein, Sieg. *Kinderzeichnungen bis zum 14 Lebensjahre.* Voigtlander, 1905, 119 pp. (Many drawings and bibliography.)

Locker, J. C. With What Should Drawing Begin? *Proc. Int. Cong. Ed.*, N. Y., 1894, 491.

Lukens, H. T. Drawing. *Proc. N. E. A.*, 1899, 945-951.

Children's Drawings in Early Years. *Ped. Sem.*, 1896-7, 79-110. (Gives pictures. Good.)

McDougall, Wm. Investigation of Color Sense of Two Infants. *Brit. Jour. Psy.*, 1908, 338-352.

Maitland, M. L. What Children Draw to Please Themselves. *Inland Ed.*, Vol. I, 1895.

Eskimo Drawings. *N. W. Mo.*, June 1899, 443-450.

Marsden, R. E. Early Color Sense. *Psy. Rev.*, 1903, Vol. X, 297-300.

Mason, W. A. Psychology of the Object. *Ed.*, 1894, Vol. XV.

Monroe, W. S. Color Sense of Young Children. *Paid.*, 1907, 7-10.

Munsell, E. H. Measured Training of the Color Sense. *Ed.*, 1909, 360-380.

Myers, C. S. Development of the Color Sense. *Brit. Jour. Psy.*, 1908, 353-362.

Nagel, W. A. Color Sense of a Child. *Jour. Comp. Neur. and Psy.*, 1906, 16, 219-230.

O'Shea, M. V. Children's Expression through Drawing. *Proc. N. E. A.*, 1897, 1015-1023.

Some Aspects of Drawing. *Ed. Rev.*, Oct. 1897, Vol. XIV, 263-284. (General.)

Parker, F. W. *Talks on Pedagogics.* Chapter X. Flanagan, Chicago. $1.50.

Partridge, Lena. Children's Drawings of Men and Women. *Barnes's Studies in Ed.*, May 1902, Vol. II, 163-179.

Partridge, Sophia S. Children's Drawings. *Paid.*, Nov. 1904, Vol. IV, No. 3, 130-168. (This gives a comprehensive bibliography on the subject.)

Pedagogical Seminary, 1891, 445-447. Notes on Children's Drawings.

Perez, B. *L'art et la poésie chez l'enfant.* Alcan, Paris, 1888, 309 pp.

Plessy, ———. Typical Children's Drawings and Some Conclusions. *App. Art Book*, Oct. 1901, Vol. I, 12-19.

Ricci, C. Summary of his work in *Pedagogical Seminary*, 1894-6, 302-307.

Rooper, T. G. Drawing in Infant Schools. In *Selected Writings*, 1907, 58-76.

Rouma, Georges. *Le langage graphique de l'enfant.* Misch et Thron, Brux., 1912, 288 pp. et bib. (Many drawings and summaries of previous work.)

Runcinan, J. Drawing in London Board Schools. *Mag. of Art*, Vol. VIII, 21-28.

Sargent, Walter. Experimental Pedagogy of Drawing. *Jour. Ed. Psy.*, Vol. III, 1912, 264-276.

Sully, James. ***Studies of Childhood.*** Chapter on The Child as Artist and The Young Draughtsman.

Taylor, E. J. ***Color Sense Training and Color Using.*** Blackie, London, 1908, 88 pp.

Tucker, A. Winifred. Color Vision of School Children. ***Brit. Jour. Psy.***, 1911, 33-43.

Watt, H. J. Æsthetic Appreciation in Children. ***Child Study***, 1910, 1-13.

Wilson, Mrs. L. L. W. ***Picture Study in Elementary Schools.*** Macmillan, 1909.

Winch, W. H. Color Preferences of School Children. ***Brit. Jour. Psy.***, 1909, 42-65.

Color Names of English School Children. ***Am. Jour. Psy.***, 1910, 453-482.

Wooley, Helen T. Color Perceptions of an Infant. ***Psy. Rev.***, 1909, 363-376.

Woolner, T. Value of Drawing. ***Mag. of Art***, Vol. XV.

CHAPTER XX

PLAY

1. Get data from children of all grades in fall, winter, spring, and summer as to the play that they like the best of all. **Observations**

2. Get data about clubs and societies that are formed and managed without adult encouragement and aid.

3. Keep records as to the plays of little children.

4. Collect accounts of plays and games used in formal education, stating the purpose for which they are used and how far they accomplish the purpose.

In taking up the subject of play we shall find many connections with the topics previously discussed. Play seems to be to a large extent the form in which childish ideas express themselves. It is to the child what his life work is to the man, and shows therefore most clearly what his nature is when left to himself. On this account observation of the free play of children is of great assistance to a teacher in learning their true characteristics. **Education in play**

Even from the earliest times there have been educators who differed from the Hinterschlag professor. This worthy man knew of the soul only "that it had a faculty called memory and could be acted upon through the muscular integument by the application of birch rods." On the other hand, 2300 years ago Plato said: "The plays of children have the mightiest influence on the maintenance of laws—from the first years of childhood,

their plays ought to be subject to laws, for if they are arbitrary and lawless, how can children ever become virtuous men, abiding by law?" Aristotle advised that the children before five years of age "should be taught nothing, lest it hinder growth, but should be accustomed to use much motion—and this can be acquired by various means, among others by play, which ought to be neither too illiberal nor too laborious nor lazy." Luther tells us that "Solomon did not prohibit scholars from play at the proper time. A young man shut up (without recreation) is like a young tree which ought to bear fruit but is planted in a pot."

Locke asserts that "the gamesome humor of childhood which is wisely adapted by nature to its age and temper, should be encouraged, to keep up their spirits and improve their health and strength. The chief art is to make all that children have to do, sport and play." He invented games for teaching reading, and suggested others. Richter in his Levana says that "activity alone can bring and hold serenity and happiness. Unlike our games, the plays of children are the expressions of serious activity, although in light, airy dress. Play is the first poetical (creative) utterance of man." Schiller says, "Man is man only when he plays."

Finally Froebel, in the *Education of Man*, says: "Play is the highest phase of the child development—for it is self-attentive representation of the inner life from inner necessity and impulse. Play is the purest, most spiritual activity of man, at this stage, and at the same time typical of human life as a whole,—of the inner, hidden, natural life in man and all things. It gives joy, freedom, contentment, inner and outer rest, peace with the world. It holds the sources of all that is good. A child that plays thoroughly, with

Froebel on play

self-active determination, will surely be a thorough, determined man, capable of self-sacrifice for the promotion of the welfare of himself and others. The spontaneous play of the child discloses the future inner life of the man. If the child is injured at this period, if the germinal leaves of the future tree of his life are marred at this time, he will only with the greatest difficulty and the utmost effort grow into strong manhood."

More recent study and observation have served only to emphasize these utterances and to show in detail their truth. Spencer tells us that all education, so far as it is true, tends to revert to play, and Preyer compares the child's play, in its value to him, to the work of the learned man.

Play and work

The distinction between play and work is a difficult one to draw. It is evidently not merely in the acts, nor in their result; to Tom Sawyer, white-washing the fence was the hardest sort of drudgery, but he made it into play for his boy friends and made them pay him for the privilege of playing at it. Again, if a boy has to play marbles when he wants to go to a fire, the play becomes work. We often say that if we had to do as work what we play at — camping out, making century runs, etc. — we should consider ourselves much abused. It is not alone the amount of effort, therefore, or the fact of having a definite end, that makes an activity work instead of play. It seems to be rather that the activity is pleasurable and spontaneous; that there is no external or internal compulsion laid upon the player. Play in this sense includes all truly artistic work. It is not the opposite of work but the best way of doing work. It is working in the spirit of love, instead of in the spirit of duty. And yet we distinguish such work from play in that it does, after all,

go beyond itself in the artist's appreciation of the ethical and social value of his art.

Shut out play from work, and we get weariness and stupidity; we exclude growth, physical, intellectual, and moral. The child who does not like play is abnormal. He is sick or stupid. He ought not to prefer to sit in his seat when the others are romping. Such a child is very likely to exhibit some of the signs of nervousness described in the first chapter, or signs of poor nutrition—either not enough food or else not the right kind. A distinction should also be made between games and play. All games are play, but not all plays are games. Games are organized, systematized play, and involve more than one child.

Theory of play

Groos, in his theory of play, considers the physiological, biological, and psychological factors, in order to get a complete theory.

1. The physiological standpoint

There are two principles to which we must refer for a physiological theory of play,—the discharge of surplus energy and the recreation of exhausted powers. The first is likely to occur when, through rest or disuse, any set of organs has stored up more force than it needs, which force, therefore, tends to find an outlet in any convenient direction. The second happens when we are tired of mental or physical labor, but still do not need rest, and so turn to the change and recreation given by play. In both cases, a play so begun may be carried to the point of exhaustion, because any movement set up in the body tends to repeat itself and to produce a trance-like condition which is irresistible.

The first overflow of energy is illustrated in the activity of a little child in the morning, when he jumps and skips from good spirits; the recreation, in his later

conduct, when he turns from one play to another. In both cases, he may continue until he is tired out.

Such a theory is satisfactory for certain forms of play, but it leaves untouched the question of why the surplus energy and recreation take the particular forms that they do, and must therefore be supplemented from the biological standpoint.

2. The biological standpoint

We do not find the play instinct in animals that have to support themselves from birth. It develops in proportion as the animal is freed from the serious duties of life. The highly developed animals are the most unfit to provide for themselves at birth, are the most plastic or educable, and require the longest period of infancy or caretaking. These animals are also the most playful. We do not think of an oyster, and hardly of a chick, as playing. But colts, puppies, kittens, are all playful, while the child is the player par excellence, and play is a large part of his training for life.

Patrick has discussed this point in his article on the Psychology of Relaxation, in which he says that relaxation, recreation, play, etc., are found in those forms of activity which put us on a somewhat lower phylogenetic level than we usually live on. Very many forms of children's play are reproductions of ancient activities, such as all games of hunting, flight and capture, throwing, hitting, etc. The child's musical instruments, the rattle, horn and drum, are also those of primitive man; the jackknife once meant safety and food to its owner; the hobby horse is the modern representative to the child of early man's dependence upon the horse; fishing is a reverberation of racial activities, etc.

This is the same genetic point of view which Hall has been presenting for years, according to which the child

repeats in his own development the fundamental psychical and physical activities of the race. It differs from the earlier presentation of the recapitulatory and culture epoch theories in not insisting upon the same order of reproduction, and in recognizing that in the psyche, as in the soma, the early stages in the development of the human being of to-day, while showing beyond question traces of pre-human as well as primitive human history, are also profoundly modified by the more recent history of mankind. Just as the *Anlage* of the brain in the human embryo appears very early and is strikingly greater than in any animal, though at the same time there are gill-slits showing our fish ancestry, so it is in the psyche. The baby learning to throw a ball is recapitulating an early stage of human history, but his psychical processes in doing so are shot through also with the later stages and with the social reactions of those about him. A game like Prisoner's Base or a vacation camping-out is like a hand-woven rug of a most intricate and many-colored pattern, which has been passed down in the making from generation to generation, so that the threads are not only of different colors but of different strength, and the weaving of differing skill in different parts.

The superfluous energy and the desire for recreation find the easiest outlets through the channels of instincts, and thus not only recapitulate race experience but serve the useful function of being an important form of organic exercise. It seems to be true that the spontaneous actions of play are the same as those which the child will need later to use seriously. We find plays varying in different species of animals, according to their instincts. Thus, a puppy plays vigorously at biting and fighting, in his way, and so is trained for actual fighting later. A kitten plays very differently from a puppy, but its play

serves equally well to prepare it for its life. Children, in like manner, play according to the way their ancestors have acted. The channels worn by ages of use are the easiest ones through which superfluous energy can escape, and so both the spontaneous and the imitative tendencies tend to the reproduction of racial activities, hunting of animals, sham fights, and so on. The believers in the culture-epoch theory put here also the plays of tent life, cave life, pastoral life, which most children go through at some time. Some of the games based on the hunting instinct are games of chase, like tag; games of searching, like hide-and-seek; games of hurling, like quoits. Based on the fighting instinct are games of contest, like football; and all that bring out emulation, like racing.

The element of imitation doubtless enters into all these plays, but unless they appealed to some natural tendencies they would not be imitated. In the various kindergarten plays we find an attempt to make this tendency regularly serviceable in education.

Now all these plays which thus reproduce race activities are of value also because they provide a large amount of exercise for the child, and so aid greatly in bodily control. As they reproduce adult activities, however crudely, they train the muscles for those activities. The girl in her playhouse is learning how to handle the household utensils carefully. The boy in his baseball and running games gains a fleetness and readiness that are serviceable in all but the most sedentary occupations. There is no part of the body left undeveloped by the plays of children. Ordinarily also, this exercise can be secured in no other way. Gymnastics are not comparable with free play, for they exercise only certain sets of muscles and the same sets for all children, whereas free play allows each child to exercise the least used

muscles, and also relieves the strain of attention. Further, because children do not especially enjoy gymnastics, they do them only under direction, and do not get as much exercise as from free play. Gymnastics are, of course, valuable when children do not get plays that exercise all the muscles, or when they are deformed or developed unsymmetrically; but, says one writer, the finest type of physical man is not produced by the gymnasia or the palæstra, but by games — rowing and running, football and baseball, golf and tennis. The movement for playgrounds in the city thus assumes as great an importance as the securing of gymnasia, especially because the children do not get any of the natural opportunities for exercise either in work or in play that the country and village children get.

3. The psychological standpoint

When we approach the question of the mental state of the playing child, one of the most prominent factors is his acceptance of an illusion, his playing of a part. The girl who makes a doll out of a sofa pillow and the boy who plays soldier, know that they are "making believe," and yet accept the pretense with delight. Lange calls it a conscious self-deception, in which a period of illusion follows a moment of readjustment. The combination of the two is seen in laughing boys in a sham fight.

Groos believes that the delight in the illusion is due to the feeling of freedom in accepting the illusion and joy in being the cause of it. The child is guarded from error by the subconsciousness that he himself created the thing, and so plays joyously with it as if it were a reality. Such plays pass by slow transitions into artistic creation and invention, in which the sense of unreality is replaced by belief in their truth and their social value.

Much of what is called play in babies and little children

is rather an experimenting with the senses and motor apparatus for the sake of the new feelings thus produced. Such plays are based directly upon the instinctive demand of these organs for activity, and are lacking in the factor of illusion which we have just mentioned. They serve the biological purpose already mentioned. Numerous illustrations of this might be given from every sense.

First play an experimenting

1. *Touch.* Very early in life a baby enjoys stroking, and seeks to put everything into his mouth. The latter is done not only when the child is hungry but when he has just been fed, and is enjoyed for the contact with the lips and tongue. In the bath, he gets various sensations by splashing. The baby explores his body, handles all he can reach, and in every way plays with the touch sensations.

2. *Temperature.* The seeking of a stinging air, a cool breeze, a hot sun, not so much to relieve any discomfort as to enjoy them, are instances of play here.

3. *Taste.* The love of having something in the mouth —candy, gum, a clove, an olive stone, tobacco—testifies to the playful use we all make of touch. Even a stone or a tasteless bit of beeswax satisfies some people when they can get nothing better. In such cases the intention is not, of course, to satisfy hunger, but simply to get new sensations.

4. *Smell.* We do not find play so much in evidence here, although sometimes children do play games that call into use the sense of smell.

5. *Hearing.* We spoke at some length of hearing, under the head of music. Here we have only to note that these first sounds that are heard and produced with so much pleasure are to the child a form of play. He listens and reproduces, makes up rimes, and repeats

his chain rimes, Mother Goose, and so on, in a spontaneous enjoyment that asks for nothing more. He is not limited to his own voice, but rattles and shakes and tears anything that he can get hold of, to satisfy his insatiable ear.

6. *Sight.* The same is true of sight. Whether it is merely the enjoyment of brightness and color, or the more complex delight in forms and in objects, a child is constantly seeking to produce a new experience or to repeat a pleasurable old one.

7. *Playful movements of the bodily organs.* All this play with the senses involves movement, but we find the child also experimenting in all sorts of ways with his hands and legs and head, putting them into all sorts of positions and enjoying himself immensely. In course of time he learns to run and walk, and then we can see plainly his play in jumping, stamping, rowing, taking difficult steps, climbing, and giving himself a thousand tests of skill. He does not limit himself to his own body, either, but takes possession of anything upon which he can exercise his muscles. He tears paper, shakes keys and all noisy objects, splashes water, and so on.

Favorite plays

Considerable observation has been made of children's free play with a view to seeing just what they do when left alone. Many nationalities and classes have been observed with the interesting result that children of the same age, whatever their nationality or social class, play essentially the same games and plays. The names may differ, but certain characteristics are common to all. As we should expect, the plays of little children of the kindergarten age are much more imitative than those of older children. Playing family and store are by far the most popular

both with girls and boys, and in these plays the home life is reproduced, often with startling fidelity. Playing church comes next to these, but it is played only about one third as much as the others.

In observations made on twenty-nine kindergarten children, five to six years old, it was found that in their plays they divided spontaneously into four groups. The first group consisted of the older boys. Their plays contained much action and imagination. In three months thirty-one dramatic plays were observed, such as policeman, fireman, store.

The second group was made up of the older girls. Their plays were also dramatic, but quieter than the boys'. Playing house and school were the great favorites.

The third consisted of the smaller children and older bashful girls. They played simple games, but spent most of their time in rushing from one to the other of the other groups as they were attracted by the games going on.

The fourth group consisted of the left-overs, listless children, who did not seem to care for any game, and spent most of their time in the swing.

All these plays are imitative rather than inventive. It is interesting to notice that usually the same play is played on consecutive days, the interest shifting only by degrees. Thus, if house is played on one day, it is likely to be played for a while the next day. That day another game may be introduced also, and this will be likely to survive the next day, and so on. Some plays are played almost every day, but what shifting there is, is of this gradual nature.

The particular play chosen seemed to be selected either because the children liked it very much, or because some child of strong personality forced his liking upon the others even if they did not care for the play.

The latter was not at all an uncommon occurrence.

Children below seven years of age rarely play games unless stimulated by older children or by adults. Their plays are individualistic and non-competitive. The question has been raised seriously, therefore, whether the kindergarten should force coöperation upon its children; whether it is not urging them into a stage for which they are not yet ready. Froebel himself, it is urged, says that boyhood, rather than childhood, is the time when the unity with others comes to consciousness, and that childhood is the time for learning to perceive things as distinct. The feeling of unity is vague, and the tendency is toward defining percepts and ideas, making them distinct rather than related.

Character of plays of little children

The kindergarten period, up to the beginning of the second dentition, is especially the toy period. The plays usually center about some object upon which numerous imaginings can be based, the doll, the engine, etc. But it is not at all essential that the toy should be elaborate. It is better for a child to be supplied with plenty of material, such as blocks and sand, from which he can make many things, and with some simple toys, than to have expensive mechanisms which he cannot shape to his will. He ought to be able to take any toy to pieces and put it together again without injury to it.

Play with toys

Almost anything will serve a child for a toy, when he is left to his own inventions—flowers and leaves, twigs, berries, grass, bits of glass and china, iron, cloth, etc.—anything that will serve as a peg for his fancy.

It is noticeable, however, that when children make toys, they usually only copy—making sleds, hammers, axes, etc.

The universal toy is, of course, the doll, upon which both the invention and imitation of the child expend themselves to the utmost. We find from Dr. Hall's

article that children prefer dolls of certain materials, thus: wax, 22 per cent; paper, 19 per cent; china, 18 per cent; rag, 17 per cent; bisque, 12 per cent; china and cloth, 9½ per cent; rubber, 8 per cent. But lacking these, they substitute: pillows, 4½ per cent; sticks, 3 per cent; bottles, 2½ per cent; dogs, 2 per cent; cats or kittens, 1½ per cent; shawls, 2½ per cent; flowers, 1 per cent; clothespins, 1 per cent, to say nothing of such things as toy washboards or wringers in isolated cases.

The doll

Any size from 4 to 12 inches suits, but blonds with curly hair and eyes that open and shut are preferred. Babies are liked best before five years, and children after that time.

The mental qualities that are attributed to these first children are as varied as the human nature that the child knows. It is an interesting question how far a child really believes that the doll can feel, be good, be jealous, and so on, and how far she is conscious of its lifelessness. In feeding a doll, for instance, 1½ per cent maintain that the doll really is hungry and the same number are in doubt; 2 per cent declare that the doll never is hungry, while the great majority either feed the doll or touch the food to her mouth and then eat it themselves. In such cases there is a consciousness of the play, although a child may be really distressed over the doll's cold or sickness.

Among the qualities ascribed to dolls the most common are: goodness, 27 per cent; cold, 24 per cent; inability to love, 22 per cent; weariness, 21 per cent; hunger, 21 per cent; badness, 16 per cent; jealousy, 8½ per cent; hatred, 7 per cent; ability to sleep, 37 per cent.

The love of dolls appears to reach its height in the ninth year, although strong from the third year to the twelfth. Many girls play with dolls until they go into

long dresses and are ridiculed for their love of it; and not a few women confess to the existence of the passion. Dr. Hall questions whether this love is as closely connected with the maternal instinct as we commonly suppose, citing in proof of his statement the fact that many girls who were very fond of dolls do not, as women, care much for children, and vice versa. This may be true in isolated cases, but still play is so evidently an imitation of the mother, prompted by instinct, that we must have more than a few contrary instances to invalidate this belief.

During the second dentition, when the association-fibers of the brain are developing rapidly, the plays of children undergo as marked a change as do their other activities. There is first a period of dramatic play, which serves to connect the toy period with the next, and then the plays involve much violent exercise and become highly competitive in character and much more varied. Hide-and-seek is played by only 8 per cent of boys seven years old and by 55 per cent of boys ten years old.

Plays of older children

The interest in traditional games—hide-and-seek, tag, prisoner's base, fox and hounds—most of which involve violent exercise and competition, reaches its height in the tenth year. This is also the period when the love of animals and the desire to possess them are most prominent. If it is feasible, this desire should be gratified and the child taught to take the responsibility of feeding them. Such a care is a valuable training in kindness and unselfishness, and teaches a child to estimate more correctly the kindness of his parents in taking care of him.

Certain differences between boys and girls appear in the ten thousand children observed. As a rule, the girls' games are quieter than the boys'. They play a greater variety of games, and they do not organize as the boys

do. Football and baseball are overwhelmingly the favorites with boys, while with girls no one game has anything like that popularity. Again, no girls took part in the play with the sandpile, except occasionally, and they do not organize societies as boys do. **Boys' and girls' plays**

The following tables show the relative prominence of games and of clubs at different ages. The names at the top indicate the authority for the figures given. Percentages are given in all cases. The two figures indicate the percentages at the two age limits.

	T. R. Croswell 1,000 boys, 1,000 girls, kindergarten-high school			Z. McGhee 4,566 children, 6-18 years			W. S. Monroe 2,000 children, 7-16 years		
	Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both
Playing house	6-5	36½	Imitation	12-3	31-1				
		5⅝							
Playing school	7-1/10	25-3							
Playing horse	16-2	4-3/10							
Playing war	5½-3/10	⅜							
Play with dolls	4-⅜	26-23							
With doll furniture	2/10	8-3/10							
With tea set	0	24-7							
With doll carriage	½	23-8							
With leaves	7½-1/6	11-⅜							
With flowers	3-1/10	10-1/10							
Books and reading	8-7/10	11-2							
Music	2-⅜	6-1							
Cards	16-3	15-5	Chance	2-9	3-45				
Checkers	27-8	18-3							
Dominoes	18-4	13-2							
Hide-and-seek	8 at 55 at	7 y. 10 y.					40	60	
Ball	12-28	5-4					65	35	
Baseball							70		
Running games				31-21	12-1		Foot-ball	Tag	
Fox-hounds, foot-ball, tag, etc.							32	50	31
Games of rivalry				42-65	20-70				
Games with coöperation				25-41	10-10				
Croquet							20	44	
Rhythm and motion							27	73	

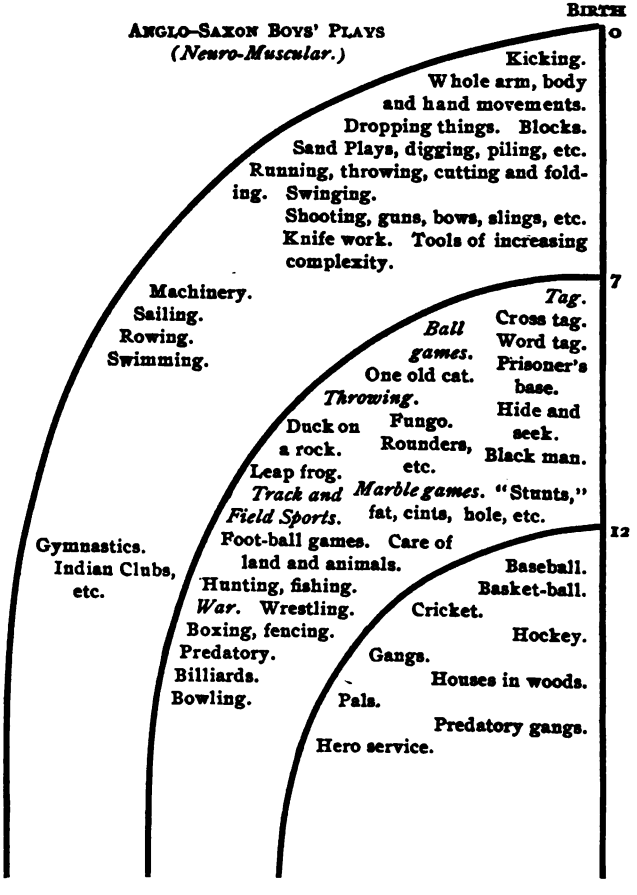


DIAGRAM 12. LUTHER GULICK'S TABLE SHOWING THE ASPECTS OF GROUP GAMES IN BOYS FROM SEVEN TO EIGHTEEN YEARS OF AGE

(Used by permission of the *Pedagogical Seminary*.)

CLUBS[1]

	8 yrs.	11 yrs.	12 yrs.	13 yrs.	17 yrs.	Total Number
Secret Societies:						
Girls	3	.....	18	.....	0	67
Boys	0	.....	3	.....	0	23
Predatory:						
THE GANG Girls	4	0	.....	.....	0	25
THE GANG Boys	4	31	.....	.....	0	111
Social Clubs:						
Girls	0	.....	22	.....	0	104
Boys	0	.....	7	.....	0	28
Industrial:						
Girls	5	.....	54	.....	1	187
Boys	0	.....	11	.....	2	59
Philanthropic:						
Girls	0	.....	.....	6	.....	22
Boys	1	.....	.....	1	.....	11
Literary Art:						
Girls	0	.....	.....	.....	15	65
Musical:						
Boys	0	.....	.....	.....	4	28
Athletic:						
Girls	1	.....	.....	15	.....	69
Boys	7	.....	.....	78	.....	406

Miss Ravenhill's study (made in winter and in school) of the play preferences of 6,369 English children between three and thirteen years of age has some very suggestive features. Her general results as to the kinds of play liked best at different ages agree with other studies except that what she classes as "active social games" are much in the lead from beginning to end, varying from about 66 per cent at three to about 48 per cent at thirteen. She, however, interprets this as due to the fact that city school children are practically forced to play such games on account of lack of room for individual play, and believes that it should be discouraged. The reasons for playing certain games in the early years are predominantly subjective—because the child gets

[1]The table is given in per cents; the totals in absolute numbers.

physical or mental pleasure—at all ages with both boys and girls. The benefits from playing the game in the shape of acquiring skill and sharpness rise slowly, and more with boys than with girls. The maximum comes with boys in the twelfth year, 48 per cent giving objective reasons, and in the same year with girls, but with only 26 per cent of them.

The favorite toys are also considered by Miss Ravenhill. With little girls, dolls lead overwhelmingly, the curve reaching its height at eight years, when 97.75 per cent say it is the best loved toy. Their second choice, from three to six and at eleven, is a carriage for the doll, and their third choice a doll's house. Up to thirteen years the doll leads, but after the ninth year balls take second place.

The first choice of boys of all ages is engines and trams, but not necessarily mechanical ones, except at six years when the favorite toy is a horse. The second choice from three to eight is some kind of wheeled toy; from nine to twelve a ball; and at thirteen a magic lantern. Their third choice has a wide range. From three to five years it is the ball; and again at seven the ball; at eleven a magic lantern, and at twelve a cricket set.

The reasons for liking the toy fall into three chief classes. The "make-believe" or dramatic instinct is much less prominent than the other two, and is about the same for boys and girls. It begins with 9 per cent of the children at four years, reaches its height in 18 per cent at six, and then diminishes again to 9 per cent at thirteen, with a fall to about 4 per cent at ten. The enjoyment of the physical activity focused about the toy is greatest at three, about 70 per cent for both boys and girls. It diminishes somewhat irregularly with the girls, with a slight rise from eight to nine, and

another from twelve to thirteen, ending with 32 per cent. With the boys, rather curiously, there is a steady diminution which is rather rapid to the tenth year (18 per cent) and is then very slow to about 16 per cent at thirteen. Some form of emotional satisfaction includes the third set of reasons. With girls this begins with 31 per cent at three, and reaches its height in 65 per cent at twelve, with a fall to 48 per cent at thirteen. With the boys it begins with 20 per cent at three, and rises to 69 per cent at eleven, with a very slight fall thence to 64 per cent at thirteen.

Psychological value of play

The psychological value of play has already been touched upon in the theory of play, and so we will emphasize here only its especial importance for nervous children. Wisely directed play can often be made a cure for hysteria, chorea, stuttering, and other such nervous diseases, where development of the muscular control, such as can be gained in play, is a desideratum.

In the cities also, where children do not naturally get the exercise that a country or a village child gets, it is imperative that the exercise should be obtained through play, not only because the body is so developed, but especially because, as we have already seen, the highest mental and moral virtues cannot easily flourish where the body is dwarfed.

Social value of play

Play is an important method of realizing the social instincts, and at this point we run across imitation again. The younger animals in their play are always imitating the older ones in their hunting and fighting, carrying it to great lengths at times.

Children in their play with each other have a most important aid to social development.

1. They gain flexibility of mind and self-control.

Plays quicken the various mental processes. Some cultivate perception and close observation; others, imagination; others require quick and accurate judgment, and so on. Many cultivate all of these to a marked extent. Self-control is given by all games to a certain extent, for a child learns to meet failure with equanimity, but competitive games especially cultivate this. In all cases where the play is not too intense, the whole emotional nature is gladdened and made buoyant. "Play is the recruiting office and drill sergeant of all the powers of the child."

2. They have endless opportunities for imitation and invention.

The children in any group always divide into two classes—the leaders and the led, the relatively inventive and the relatively imitative—but there is more or less changing of parts here. The imitative child may come to school with a new or taking trick, and thus become the leader temporarily. In both cases, each child learns his own powers and those of the others as compared with him. He gets a certain place in the group, which he can change if he can develop the necessary qualities. He finds the value of coöperation in all games where sides are taken, and at the same time the value of individuality and originality if one has ambitions to be a leader. Baldwin says: "To exhibit what I can do alone is to exhibit my importance as an ally. The sense of my weakness in myself is a revelation to me of my need of you as an ally. The presence of a stronger than either is a direct incitement to quick alliance between you and me against him. And the victory gained by the alliance is both a confirmation to us of the utility of social coöperation and a convincing proof to him that society is stronger than the individual.

The spirit of union, the sense of social dependence as set over against the spirit of private intolerance; the habit of suspension of private utilities for the larger social good; the willingness to recognize and respond to the leadership of the more competent—all this grows grandly on the playground of every school."

The classical example of the social value of play at its best is given in the "Story of a Sandpile." The story began when two boys, three and five years old, had a pile of sand to play in, and extended over nine years, the play being resumed each summer. The first two summers the play was of a desultory character, digging, making things that were soon destroyed, and so on; but by degrees it assumed an organized character, children of the neighborhood were drawn in, and a miniature village was made. The village was laid out in streets; houses, barns, and other buildings were whittled out, as were also people and animals. Gradually a government was evolved, each boy expressing the opinions and doing the work of the doll-men who occupied his section of the village. Courts were established, town meetings were held, and all the business of a town was transacted, although, of course, crudely. The village thus became an excellent training school in good citizenship.

"Story of a Sandpile"

The play was carried on only in the summer, but while in their city homes through the winter the boys would make new men and implements and get all the mechanism of the town ready for the next summer. They had set forms for their men, houses, etc., from which they rarely deviated, although as they grew older they saw the crudity of them. As the boys reached adolescence, they began to lose interest in the village, they became conscious of the observation of their play,

and gradually the village became once more only a sand pile, having served fully its educational function.

It seems hardly possible, in view of all these facts, to overestimate the value of play, and here, as in so many other cases, we see again the importance of education following the leading of the child.

In conclusion, then, we may say that from the very earliest time, play has been recognized as a valuable means of education, and that to-day it is used systematically in many schools to develop the child when the appliances of formal education fail.

At all ages, the social value of play is great, because by it each child is made to see his dependence upon others and his own use to them. Through it he is educated for good citizenship in the world of work.

REFERENCES

Theoretical and Educational Aspects of Play

Addams, Jane. *Spirit of Youth and the City Streets.* Macmillan, 1909, 162 pp.

Allin, A. Play. *U. of Colorado Studies*, Vol. I, 1902, 59-73.

Appleton, Lilla E. *Play Activities of Adult Savages and Civilized Children.* U. of Chicago Press, Chicago, 1910, 94 pp.

Arrowsmith, John. Brain Development through Play. *Paid.*, 1907, 52-64.

Austin, Alice. Children at Play. *Outlook*, 1912, 201-218.

Blow, Susan E. *Symbolic Education*, 111-145. Appleton.

Bolin, Jakob. Group Contests. *Am. Phys. Ed. Rev.*, Vol. LIV, 288-294.

Bolton, H. C. *Counting-out Rhymes of Children.* London. $1.75.

Brown, T. Y. Boys' Games. *Assn. Outlook*, Feb. 1899, 96-107.

Carr, H. A. *Survival Values of Play.* U. of Colorado Pub., Dept. of Psychology, 1902.

Chamberlain, A. F. *The Child*, 10-27. W. Scott.

Chase, J. H. Street Games of New York Children. *Ped. Sem.*, 1905, Vol. XII, 503-504.

Compayré, G. *Intellectual and Moral Development of the Child.* Chapter on Play. Appleton, N. Y. $1.50.

Croswell, T. R. Amusements of Two Thousand Worcester School Children. *Ped. Sem.*, 1898-99, 314-371. (Very full account.)

Culin, Stewart. Street Games of Brooklyn. *Am. Jour. Folk Lore*, July to September 1891, 221-237.

Curtis, H. S. Playground Movement in America. *Ped. Sem.*, 1909, 344-350.

Play Instinct. *Kgn. Mag.*, 1901, Vol. XIII, 424-432.

Reorganizing the School Playground. *Bull. U. S. Bur. Ed.*, No. 16, 23 pp. Free.

Felker, Allie M. Play as a Means of Idealizing. *Proc. N. E. A.*, 1898, 624-630.

Fiske, John E. *Meaning of Infancy.* Houghton, Mifflin, 1909, 42 pp.

Forbush, W. B. Social Pedagogy of Babyhood. *Ped. Sem.*, 1900, 307-335. (Inspiring.)

Froebel, F. *Education of Man.* See Analytical Index on Play. Appleton, N. Y. $1.50.

Groos, Karl. *Th Play of Man.* Appleton, N. Y. $1.50.

The Play of Animals. Appleton, N. Y. $1.75.

Gulick, Luther. Psychological, Pedagogical and Religious Apsect of Group Games. *Ped. Sem.*, 1899, 135-151. (Suggestive:)

Psychical Aspects of Muscular Exercise. *Pop. Sc. Mo.*, October 1898, Vol. LIII, 705-793.

Hall, G. Stanley. Dolls. *Ped. Sem.*, 1896, 129-175.

Story of a Sandpile. *Scribner's Mag.*, June 1888.

Howells, W. D. *A Boy's Town.* Harper, N. Y. $1.25.

Hutchinson, Woods. Play as an Education. *Contemp. Rev.*, 1903, 375-394.

Kennard, Beulah. Play Life of Girls. *Clark Con. for Child Welfare*, Vol. II, 1910, 47-54.

Johnson, G. E. Play in Physical Education. *Proc. N. E. A.*, 1898, 948-954. (Good.)

Education by Plays and Games. *Ped. Sem.*, 1894. (Review of games of children over six years, with qualities developed by each. Good.)

Education by Plays and Games. Ginn, 1907, 234 pp. (The most inclusive. Gives graded series.)

Play as Moral Equivalent of War. *Am. Phys. Ed. Rev.*, 1911, 291-301.

What to Do at Recess. Ginn, 1910, 33 pp.

Lee, Joseph. Playground Education. *Ed. Rev.*, 1901, 449-471.
Play for Home. *Play and Rec. Assn.*, 1913.
How to Start and Organize Playgrounds. *Ibid.*
Boston Playground System. *N. E. Mag.*, 1903, N. S., Vol. XXVII, 521-536.
Play as Medicine. *Nat. Con. Char. Corr.*, 1911, 354-364.
Play as Antidote to Civilization. *Playground*, 1911, 110-126.
Sunday Play. *Playground*, 1910, 221-232.
Two Kinds of Play. *Am. Phys. Ed. Rev.*, 1911, 439-446.
McGhee, Zach. Play Life of Some South Carolina Children. *Ped. Sem.*, Dec. 1900. (Children all ages. Good.)
McKee, J. H.. Developmental Influences of Play. *Pediatrics*, 1899.
Mero, Everett B. (ed.). *American Playgrounds: their Construction, Equipment, Maintenance and Utility.* Am. Gymnasia Co., 1908, 270 pp.
Monroe, W. S. Play Interests of Children. *Proc. N. E. A.*, 1899, 1084-1090. (Good, but limited to summer plays.)
Normal Course in Play. *Rept. Proc. 3d Am. Cong. of Playground Assn. of Am.*, 1909; also separate volume, 288 pp.
Patrick, G. T. W. Psychology of Relaxation. *Pop. Sc. Mo.*, June 1914, 590-604.
Pollock, Susan P. Ideal Play in the Kindergarten. *Proc. N. E. A.*, 1898, 604-608.
Poulsson, Emilie. From Play to Earnest. *Kgn. Rev.*, Vol. IX, 687.
Ravenhill, Alice. Play Interests of English Elementary School Children. *Child*, Dec. 1910, 217-226; *Child Study*, 1911, 121-142.
Recreation Bibliography. Russell Sage Foun. Pub., 1912, 37 pp.
Reports of Playground Association of America.
Seeley, Levi. Play as an Educational Factor. *Jour. of Ped.*, 1905, 100-112.
Sisson, Genevra. Children's Plays. *Barnes's Studies in Education.* U. of Chicago Press, Chicago. (Study of 29 kindergarten children. Good.)
Stitt, E. W. Recreation as Cure for City Evils. *Assn. Sem.*, 1912, 219-235.
Sully, James. *Studies of Childhood.* (Imagination in Play.) Appleton, N. Y. $2.50.
Winch, W. H. Psychology and Philosophy of Play. *Mind*, N. S., 1906, Vol. XV, 32-52; 177-190.
For recent movements, see also *The Playground.* Edited from 1 Madison Avenue, N. Y. Monthly, $2.00 per year.

Toys

Allemagne, Henri R. *Histoire des jouets.* Hachette, Paris, 316 pp.

Bjurman, A. *Toys and Games.* Pub. privately, Maplewood, Mass., 1913. $0.75.

Claretie, Leo. *Les jouets, histoire, fabrication.* Quantin, Paris, 1894, 325 pp.

Jackson, Mrs. O. N. *Toys of Other Days.* Scribner's, 1908, 309 pp.

Johnson, G. F. *Toys and Toy Making.* Lond., 1912, 160 pp.

Poulsson, Laura E. Thoughts for Toybuyers. *Kgn. Rev.*, Dec. 1901, 190-6.

Schmidt, O. E. *Dolls, Dead and Alive.* Caton, 1911, 42 pp.

Starr, Laura B. *The Doll Book.* Outing Pub. Co., 1908, 238 pp.

Swannell, M. Toymaking for Little Children. *Child Life*, Feb. 15, 1913, 51-55.

Wardle, Phyllis. Tools and a Boy. *Kgn. Rev.*, 1901, Vol. XI, 267-270.

Games and Plays

Allen, Annie W. *Home, School and Vacation.* Houghton, Mifflin, 1907, 220 pp.

Angell, Emmett D. *Play . . . Games for Kindergarten, Playground, etc.* Little, Brown, 1910, 190 pp.

Bailey, Carolyn S. Rainy Day Plays. *Kgn. Rev.*, 1908, 30-33, 100-103.

Bancroft, Jessie H. *Games.* Macmillan, 1909, 456 pp.

Barker, J. S. *Games for the Playground.* Longmans, 1910, 65 pp.

Cary, C. B. *Plays and Games for Schools.* Madison, 1911, 86 pp.

Champlin, J. D., and Bostwick, A. E. *Young People's Encyclopedia of Games and Sports.* Holt and Co., N. Y. $2.50.

Chesterton, Thomas. *Organized Playground Games.* Ed. Supply Assn., Lond., 1901, 115 pp.

Dowd, Emma C. *Playtime Games for Boys and Girls.* Jacobs, Phila., 1912. $0.75.

Elston, F. *Organized Games.* Arnold and Son, Leeds, 1904, 192 pp.

Gomme, Alice B. *Children's Singing Games.* Macmillan, N. Y. $1.50. (Pictures, directions, and music for the games.)

Hofer, Marie R. *Children's Singing Games, Old and New.* Flanagan, Chicago, 1901, 42 pp.

Kimmins, Grace T. *Guild of Play Book of Festival and Dance.* 3 vols. Curwen and Sons, Lond., 1907-10 (pictures, music, and rimes), 5s. per vol.

Lamkin, Nina B. *Play, its Value and Fifty Games.* Holbrook-Barber Co., Chicago, 1907, 91 pp.

Lincoln, Jeannette E. C. *Maypole Possibilities.* Am. Gymnasia Co., 1907, 56 pp.

Lucas, E. V. and E. *What Shall We Do Now?* Richards, Lond., 1900, 364 pp.

Murray, E. R., *et al.* Kindergarten Games. *Child Life Sup.*, 1901, 169-184.

Neal, Mary. *Esperance Morris Book.* Curwen and Sons, Lond., 1910, 64 pp.

Newton, Marion B. *Graded Games and Rhythmic Exercises for Primary Schools.* N. Y., 1908, 110 pp.

Page, Mary B. Plays and Games of the Kindergarten. *Ele. Sch. Teach.*, 1909, 341-358.

Parsons, Belle R. *Plays and Games for Indoors and Out.* Barnes, 1909, 215 pp.

Reindorp, Jacques. *Record of the Toolhouse Club.* Low, Lond., 1911, 238 pp.

Scharlieb, Mary A. D. Recreational Activities of Girls during Adolescence. *Child Study*, 1911, 1-14; *Child*, 1911, 571-586.

Smith, David E. Number Games and Rhymes. *Teach. Col. Rec.*, Nov. 1912, 1-110.

Stoneroad, Rebecca. *Gymnastic Stories and Plays for Primary Schools.* Heath, 1907, 150 pp.

Stoudt, J. B. Pennsylvania German Riddles and Nursery Rhymes. *Jour. Am. Folk Lore*, 1906, 113-121.

CHAPTER XXI

The Child in a Democracy

AND now let us gather up the many threads and view as a whole the pattern which we have been weaving. We have considered the child in abstraction from many standpoints—as a physical organism subject to diseases and needing numerous provisions in the way of medical and dental care, good food, air, and exercise. We have looked on him as a perceptive animal, as a motor being, as remembering, imagining, and reflecting, as conscience stricken, worshipful, emotional, artistic, musical, and playful. But the whole child, as has been implied from start to finish, is all these and more than all these at once. The most significant thing of all is that the growth of his personality in any direction is a matter of stimulus and reaction between himself and his surroundings, and that for the child the "surroundings" are primarily the people about him. He gets his physical environment only as modified by persons. The baby, as we saw, has no opportunity to separate even his food from his mother; and thus from the beginning persons are the most interesting things of all.

The later development of his personality through the constant interactions between himself and others has also been indicated at various places, and we have seen that a large part of his moral training consists in making these interactions of such a character that social approval shall be bound up with the good and disapproval with the bad.

In a democracy this consensus of feeling and opinion is of especial importance, inasmuch as it is the true power of government—the power which determines the casting of votes.

When manhood—or full—suffrage prevails, the success of the government depends in the long run on the interest, intelligence, and social virtues of those who cast the votes. But these are the outcome of all their previous training. The fathers of our country, we realize more and more, were fundamentally right in their belief that only universal education could preserve a democracy.

But, say some, it has not preserved our democracy. We are in fact an oligarchy of the worst type. There has been and still is too much truth in this point of view, but there is still more in the more optimistic standpoint that democracy is still alive and is now finding worthy and permanent forms of expression and of training. These are what we wish briefly to consider now.

Self-control on the one hand and love of social service on the other are the two great virtues without which a democracy cannot last. Neither virtue is acquired in a day, nor does either come by grace of human nature, though both have their roots in instinct. From the beginning of life both are developed in the give and take of daily intercourse, if the family life is normal and wholesome, and when the child enters school a more formal training in both should begin. Here the problem of the relation between teacher and pupil is the paramount one. Should the school be an absolute monarchy or a democracy? Is the teacher one of the school or outside of it?

We have heard much of pupil self-government in the last few years, both of its successes and its failures.

The term itself covers many different things, from systems in which the pupils take entire control of the discipline to those in which only one or two unimportant features are given into their hands. In some cases very complicated apparatus is introduced, such as all the officials and methods of a city or state government. To what extent are children capable of this, and how far is it wholesome for them? Teachers considering the introduction of some such system should get both sides of the question, as indicated in our references. Our own opinion is briefly this:

First as to the teacher's attitude. A true teacher has in mind only one thing, that is, the growth of her pupils. She no more takes the attitude of a czar than she does that of an outsider. Her business is to give each child just as much opportunity to control himself and to help others as he can possibly use, and to intervene when he has reached the limit of his ability at any given time, both to save the others from him and to save him from his own errors, which he will soon outgrow unless left to them. She will as far as possible always enlist pupils in making the regulations necessary for the schoolroom management, but she will precede this by getting a spirit of friendly coöperation, and at certain points, when the children's judgment and moral sense are still defective, she will take the control into her own hands. The most important question that she has to determine is how far the children in her room are capable of self-government.

The answer to this question comes from observation. We know that the period from seven to twelve years is primarily one of individualism, if not of actual competition. The spontaneous games of children at this time are those in which each child has plenty of chance

to go on alone, to emulate others. Teams are rarely found, and the same is true of clubs and organizations. At about eleven years, however, the curve for clubs and societies begins to rise sharply and goes up rapidly for at least six or seven years. This seems to indicate a natural point at which self-government may be introduced if other conditions are favorable. Undoubtedly under some teachers a large degree of self-government will succeed even in the primary grades, but one may fairly ask whether it is well to force the child too soon into work for which he certainly has little natural desire at this time. We do not mean to say that in the primary grades there should be no mutual help between teachers and pupils. Quite the contrary. The wise teacher will be laying here the foundations for the enlarged social activities that properly belong in the grammar grades. In the grammar grades we do believe that some form of self-government is not only possible but desirable, but it should be understood that this does not mean the exclusion of the teacher. The teacher too is part of the school, and her chief task in a self-government system is to keep the ideals high without forcing the children too much. The give and take between teacher and pupils, the genuine *training* in the ideals of democracy thus made possible, is the great gain in any self-government system. If the teacher stands to one side and considers the discipline none of her business, the plan is very likely to fail, for children and youth, even college youth, are, as we have seen, still rather undeveloped in the social virtues. Cliques are likely to develop, rank injustice to appear, and the plan will finally be rooted out as a failure, when the true failure is the indifferent teacher.

Self-government in schools, from the grammar grades

through the college, is in reality a training in self-government, we might almost say a trial of self-government. It must be admittedly incomplete to some degree if we admit that pupils are morally immature, and it must derive a large part of its inspiration and ideals from the teacher if the teacher is truly a teacher and the pupils, pupils. But as an instrument for teaching the ideals and methods of democracy, for breaking down the spirit of clique and caste, and for developing a sense of social responsibility and a habit of socialized behavior, it can scarcely be equaled.

The particular form that it assumes is relatively unimportant, except that with the grammar grades the form should be as simple as possible.

Coincident with the spread of self-government within the schools has gone the enlargement of the school ideal in all directions. We have already briefly indicated how the school has taken up the work of medical inspection, and even the mother's work of feeding and bathing the child. Now it is beginning to choose his vocation and to train him for it, to say nothing of taking charge of his play hours and vacation months. What does this great movement mean? Is the child to be taken out of the home entirely, and shall we end by having public nurseries, as Plato suggested, to which children will be entrusted as soon after birth as possible? The Montessori schools take three-year-old children and keep them all day, and day nurseries in our cities take babies.

But such a fear is not justified. Rather, the child is bringing the home to the school, as Ward points out, in the great movement now going on to make the school the social center. "America in the public school has taken the child and set him in the midst as Jesus took

the child and set him in the midst. The invigorating atmosphere of the child's unfoldment is the breath of life. The light of the child's presence in the thought of men and women enables them to see. The place of the children's education, at the center of the neighborhood, has in its freedom from dogma, its democratic foundation, its limitless aspiration, its vital character, not only the most powerful dynamic possibility for molding the future, but in its use by men and women to-day . . . the certainty of developing . . . the power to feel, to suffer and enjoy in terms of the membership of the neighborhood."

In this larger use of the school plant—which, it should never be forgotten, belongs to all of the people and not to the School Board—are included not only evening schools and vacation schools but also the use of the rooms for neighborhood gatherings of all sorts. Ward says there should be at least three organizations, one for adults, one for young men, and one for young women, and the whole system should be under the direction of either the school principal or his assistant, who should be definitely engaged and paid for this work, while some of their clerical work should be passed over to clerks. But the work soon spreads beyond these narrow limits. In the cities classes and clubs of all sorts spring up, children from crowded homes come back to study, if only a quiet place and a sympathetic helper are provided. Voters meet to have their alderman explain civic policies; women meet to cook and sew; young folks come to dance and sing, and the old folks often join them. There is a moving-picture outfit which displays everything from the dangers of flies to the beauties of Italy. There is a stage with scenery and costumes, and pageants and plays are performed. There

is a playground outside with a director, open all day and all the year, fitted with apparatus for children and youth of all ages. There is the voting booth. In short, this school is the community home, the heart from which spring all the issues of life for old and young.

Nor is this only an ideal. First realized in Rochester, it has been tried out with notable success in various other cities, and in Wisconsin is being carried out on a state-wide scale. The fundamental thing for success, in Ward's opinion, is simply that there shall be free discussion and democratic control; not control and limitation by the School Board but control by the citizens and use of the school plant as they see fit. Thus organized, he believes that this movement may be the regeneration of politics, to say nothing of its beneficial effect upon the school.

Of the many other movements for the welfare of children we must briefly refer to the playground movement, which has spread like wildfire over our country, and on which New York city alone spent over fifteen million dollars in ten years. The amount of good done in opening play spaces to children, providing directors for the play, preventing control by gangs and hoodlums, and so on, cannot be estimated. Not only is juvenile crime lessened but the health is improved and the child's right to joy protected. In Chicago notably, and in many other places as well, beautifully equipped buildings have been erected on the playgrounds for winter use, and in many cases they have become to greater or less degree community centers. It seems unfortunate that this should be done, however, when the school buildings are available. Great sums of money have thus been sunk in buildings which might better have been spent in equipment and entertainment.

Another class of movements of great importance is that of organizations for young men and women. These base upon the tendency already noted to organize gangs or clubs in early adolescence, and are of the most varied character. Not only are there the great religious organizations, the Y. M. C. A., Y. W. C. A., Epworth League, Y. P. S. C. E., the Catholic sodalities, the Jewish organizations, and so on, but there are such national organizations as the Boy Scouts, Camp Fire Girls, and all the college fraternities and sororities, and an infinite number of local societies,—athletic, literary, dancing, and so on indefinitely. The danger and the good of such organizations are most obvious in the fraternities, and the battle wages most fiercely about them, but the same problems are met to some degree in every club. Who are to be taken in and who left out? And how can the one left out not be hurt and the one taken in not exalted? If every one belongs to some club, nevertheless one club soon becomes more select, or there are ranks within the club, and some never get to the center.

That is, we seem to have here not a simple question of class caste, which faculties can repress at will, but the much deeper question of the personal equation. Faculties, if wise, can do much to prevent the exaltation of false standards of selection, but no rules and regulations will ever make a certain type of personality a real member of a club, while certain others instinctively flock together. How to develop adaptability in the first and to broaden the outlook of the last to the end of greater liberality in both is a problem whose solution will probably differ in different places. Young people certainly cannot be expected to develop a very high type of organization if left to themselves, but on the other hand, faculty legislation too often legislates the

very heart out of their organizations and so they die while the young people are finding some other expression of their social nature.

Of the numerous movements by adults to ameliorate the conditions of child life, to improve child-labor laws, conditions of living, and so on, we cannot speak here. They too have a large literature, and are well summed up in Dr. Hall's chapters on Preventive and Constructive Movements.

Here we must conclude this study of the wonderful child nature to which we look for the regeneration in the race. So complex is it, so rich and so varied in its forms, that not even the completest study could fully describe it. This résumé has done its part if it has now and then given us a new glimpse of the little child who stands wondering and innocent at the threshold of life, or if it has made clearer to us the truth that to love children wisely we must know them well.

REFERENCES

Social Aspects

Baden-Powell, Robert. *Scouting for Boys.* Lond., 1910, 320 pp. Educational Possibilities of Boy Scouts' Training. *Nineteenth Cent.*, 1911, 293-305.

Baldwin, J. Mark. *The Individual and Society.* Badger, Boston, 1911, 210 pp.

Bates, E. W. *Pageants and Pageantry.* Ginn, 1912, 294 pp.

Bawden, H. Heath. Social Character of Consciousness. *Ele. Sch. Teach.*, 1904, Vol. IV, 366-376.

Blumenfeld, R. D. Boy Scouts. *Outlook*, 1910, 617-629.

Bonser, F. G. Chums: A Study in Youthful Friendships. *Ped. Sem.*, 1902, Vol. IX, 221-235.

Breckenridge, S. P., and Abbott, Edith. *The Delinquent Child and the Home.* Char. Pub. Co., N. Y., 1912, 355 pp.

Bryant, Louise S. Bibliography of Social Service. *Psy. Clinic*, Feb. 15, 1913, 263-268.

Buck, Winifred. *Self-Governing Clubs.* Macmillan, 1903, 218 pp.

Call, A. D. Education versus Crime. *Ed.*, 1902, Vol. XXII, 587-663. (Study of the Elmira Reformatory.)

Camp Fire Girls. Doubleday.

Chancellor, William Estabrook. *Our City Schools, their Direction and Management.* Heath, Boston, 1908, 333 pp.

Chesley, A. M. *Social Activities for Men and Boys.* Y. M. C. A. Press, N. Y., 1910, 304 pp. (An account of what a local Y. M. C. A. can do.)

Chubb, Percival. *Festivals and Plays.* Harper, 1912, 402 pp. Bibliog.

Clark, Kate Upson. *Bringing up Boys.* Crowell, 1899, 227 pp.

Collier, John. Moving Pictures: *Survey*, 1910, 80; *Clark Con. Child Welfare, Proc.*, 1910, 108; *Child*, 1911, 496-501; *Playground*, 1910, 232-239.

Commons, J. R. The Junior Republic. *Am. Jour. Soc.*, Vol. III, 1897-98, 281-296; 433-448.

Craig, Anne T. *Dramatic Festival.* Putnam, 1912, 354 pp.

Cronson, Bernard. *Pupil Self-Government—Its Theory and Practice.* Macmillan, N. Y., 1907, 76 pp.

Curtis, Elnora W. Dramatic Instinct in Education. *Ped. Sem.*, 1908, 299-346. Bibliog.

Dewey, John. *The Educational Situation.* U. of Chicago Press, 1902, 104 pp.

Psychology and Social Practise. U. of Chicago Press, 1901, 42 pp.

The School and Society. U. of Chicago Press, 1899, 125 pp.

Dutton, Samuel T. *Social Phases of Education in the School and in the Home.* Macmillan, Lond., 1899, 255 pp.

Dynan, Harriet. An Experiment in Civics in the Eighth Grade Room. *Child Study Mo.*, Vol. III, 1897-98, 87-94.

Folks, Homer. *Care of Destitute, Dependent and Neglected Children.* Macmillan, 1902, 251 pp. (Historical.)

Forbush, W. B. *The Boy Problem.* Pilgrim Press, 1907, 210 pp. Bibliog.

The Boys' Round Table. 6th ed., 1908, 188 pp. (An account of the Knights of King Arthur.)

The Coming Generation. Appleton, 1912, 402 pp.

Fraternity and Social Life in High Schools. *Comm. Rept.*, 1909, L. W. DeCash, Springfield, Mass., chairman.

Fry, Emma S. *Educational Dramatics.* Moffat, Yard and Co., 1913, 69 pp. $0.50.

George, Wm. R. *The Junior Republic.* Appleton, 1910, 326 pp.
Gill, John. *System of Moral and Civic Training.* N. Y. Pat. League, 1901, 152 pp.
Grice, Mary Van Meter. *Home and School.* C. Sower Co., Phila., 154 pp.
Gunckel, John E. *Boyville: Fifteen Years of Work with Toledo Newsboys,* 1905, 219 pp.
Hale, H. O. Kinematograph in School. *School World,* 1912, 361-364.
Hall, G. Stanley. Preventive and Constructive Movements, *Educational Problems,* 1911.
Hartson, Louis D. Psychology of the Club. *Ped. Sem.,* 1911, 353-414.
Herts, Alice Minnie. *Children's Educational Theater.* Harper, 1911, 150 pp.
Hill, R. C. Secret Societies in High School. *Ed. Rev.,* Vol. XLIII, 1912, 168-192.
Holman, H. Children and Cinematographs. *Child Study,* 1910, 99-108.
Hull, Wm. I. The George Junior Republic. *Ann. Am. Acad. Pol. and Soc. Sc.,* Vol. X, 1897, 73-96.
Johnson, John. Rudimentary Society among Boys. *Johns Hopkins University Studies,* 2d series, Vol. II. Also in *Overland Mo.,* October 1883. (One of the best studies of spontaneous organizations.)
Jump, Herbert A. Motion Pictures. *Rel. Ed.,* 1911, 349-354; *Playground,* 1911, 74-84.
King, Irving. *Social Aspects of Education.* Macmillan, 1912, 425 pp. Bibliog. (Excellent both for content and references.)
Langdon, U. C. Pageant of the Perfect City. *Playground,* 1911, 2-17.
Pageant of Thetford. *Playground,* 1911, 302-318.
Law, M. W. Our Ishmael. *Am. Jour. Soc.,* 1902-3, 838-851.
Lindsey, Ben. B. *The Juvenile Court of Denver in Campaign for Childhood.* Charities, N. Y., Nov. 1903.
The Beast. Doubleday, 1910, 340 pp.
McKeever, Wm. C. *Training the Boy.* Macmillan, 1913, 361 pp.
Mangold, Geo. B. *Child Problems.* Macmillan, 1910, 381 pp. Bibliog.
Merrill, Lilburn. *Winning the Boy.* Revell, 1908, 160 pp.

Moving Pictures. *Rev. of Rev.*, 1910, 315-320; *Pub. Lib.*, 1911, 19: *Outlook*, 1910, 541-542; *World To-Day*, 1910, 1132-1139; *World's Work*, 1910, 128-176.

Needham, Mary M. *Folk Festivals*. Huebsch, 1912, 244 pp.

Perry, C. A. *Wider Use of School Plant*. Char. Pub. Com., N. Y., 1910, 423 pp. (Excellent.)

Survey of Social Center Work. *Ele. Sch. Teach.*, Nov. 1912, 124-133.

Policy and Standards of the National Board of Censorship of Motion Pictures. Revised, May 1914, People's Institute, 70 Fifth Ave., N. Y., 23 pp.

Puffer, J. Adams. *The Boy and His Gang*. Houghton, Mifflin, 1912, 187 pp.

Boys' Gangs. *Ped. Sem.*, 1905, Vol. XII, 175-212.

Purcell, Helen E. Children's Dramatic Interest. *Ele. Sch. Teach.*, 1907, 510-518.

Ross, E. A. Social Psychology. Macmillan, 1908, 372 pp.

Russell, Ernest. Most Popular Play in the World. *Outing*, Jan. 1908, 463-479. (Puppet plays.)

Scott, Colin A. *Social Education*. Ginn, 1908, 300 pp.

Seton, Ernest Thompson. *Boy Scouts of America*. Doubleday, 1910, 192 pp.

Shaw, Clara. Experiments in Self-Organized Group Work. *Soc. Ed. Quart.*, Mar. 1907, 16-28.

Sheldon, H. D. Institutional Activities of American Children. *Am. Jour. Psy.*, Vol. IX, 425-448.

American Student Societies. Appleton, 1901, 366 pp.

Simmel, G. Sociology of Secrecy and Secret Societies. *Am. Jour. Soc.*, 1906, Vol. XI, 441-498.

Stelzle, Charles. *Boys of the Street*. Revell, 1904, 96 pp.

Stowe, Lyman Beecher. School Republics. *Outlook*, Dec. 26, 1908, 939-948.

Swift, Edgar J. Some Criminal Tendencies of Boyhood. *Ped. Sem.*, 1901, Vol. VIII, 65-91.

Talbot, E. S. Juvenile Female Delinquents. *Alien. and Neur.*, 1902, Vol. XXIII, 16-27; 163-175.

Thurston, H. W. Training for Citizenship in the Public Schools. *Sch. Rev.*, 1898, Vol. VI, 577-597.

Urwick, E. J. (ed.). *Studies of Boy Life in Our Cities*. Dent, Lond., 1904, 320 pp.

Wallin, J. E. W. The Moving Picture. *Ped. Sem.*, 1910, 129-142.

Ward, Edward J. *The Social Center.* Appleton, 1913, 359 pp. $1.50. (Wider use of school plant. Very complete account of the Rochester method. Bibliography.)

Wild, Lena H. Training for Social Efficiency. Series in *Ed.*, from Oct. 1912 to Mar. 1913.

Young, Ella F. *Some Types of Modern Educational Theory.* U. of Chicago Press, 1902, 70 pp.

See also *Proceedings* of the Conference for the Care of Dependent Children, of the International Congress for the Welfare and Protection of Children, of the National Association of Social Centers, and of the Playground Association.

KEY TO ABBREVIATIONS IN REFERENCES FOUND IN "THE CHILD"

Alien. and Neur. . . . . Alienist and Neurologist
Am. Acad. Pol. & Soc. Sc. . . . . American Academy Political and Social Science
Am. Anthrop. . . . . American Anthropologist
Am. Breeders Mag. . . . . .
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Arch. of Psy. . . . . Archives of Psychology
Archiv für die Gesammte Psychologie . . . . . .
Assn. Sem. . . . . Association Seminar
Bibliotheca Sacra . . . . . .
Biometrika . . . . . .
Birm. Med. Rec. . . . . Birmingham Medical Record
Bost. Nor. Sch. Gym. . . Boston Normal School of Gymnastics
Brit. Assn. Adv. Sc. British Association for Advancement of Science
Brit. Jour. Psy. . . . . British Journal of Psychology

Brit. Med. Jour. . . . . British Medical Journal
Bull. de la Soc. Libre . . . . Bulletin de la Societé Libre
Bull. of Nat. Soc. for Promotion of Ind. Ed. . . . . National Society for Promotion of Industrial Education
Bull. Bureau of Education, Washington, D. C. . . . . .
C. S. M. . . . . Child Study Monthly
Ch. Wel. Mag. . . . . Child Welfare Magazine
Cleveland Med. Jour. . . . . Medical Journal
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Econ. Jour. . . . . Economics Journal
Ed. . . . . Education
Ed. Rev. . . . . Educational Review
Ele. Sch. Teach. . . . . Elementary School Teacher
Eugenics Ed. Soc. . . . . Eugenics Education Society
Eng. Rev. . . . . English Review
Fort. Rev. . . . . Fortnightly Review
Gale's Psy. Studies . . . . . Psychological Studies
Gr. Brit. Dept. Com. . Great Britain Department of Commerce
Inland Ed.. . . . . Educator
Int. Arch. f. School Hygiene . . . . . International Archives for School Hygiene
Int. Jour. Ethics . . . . International Journal Ethics
Int. Quart. . . . . International Quarterly
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Man. Train. Mag. . . . . Manual Training Magazine
Med. Mag. . . . . Medical Magazine
Med. Rev. . . . . Medical Review
Montreal Med. Jour. . . . . Medical Journal
Mus. Teach. Nat. Assn. . Music Teachers' National Association
N. Am. Rev. . . . . North American Review
N. E. Mag. . . . . New England Magazine
N. Y. Med. Jour. . . . . .
N. Y. Teach. Mon. . . . New York Teacher's Monographs
N. W. Mo. . . . . Northwestern Monthly
Nat. Con. Char. Corr. . . . . National Conference of Charities and Corrections
Nineteenth Cent. . . . . .
Ophth. Rec. . . . . Ophthalmological Record
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Parent's Rev. . . . . .
Pediatrics . . . . . .
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Phil. Rev. . . . . Philosophical Review
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Pop. Sc. Mo. . . . . Popular Science Monthly
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Proc. Am. Phil. Soc. Proceedings American Philosophical Society
Proc. Assn. of Phys. Ed. . Association of Physical Education
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Proc. Int. Cong. School Hygiene. . . . . .
Proc. Nat. Assn. for Study and Ed. Excep. Ch. . . . . Education of Exceptional Children

Proc. N. E. A. . . . . National Education Association
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Russell Sage Foun. . Publications of Russell Sage Foundation
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Trans. Am. Philol. Assn. . . . . Transactions of American Philological Association
Trans. Ill. Soc. C. S. . . . Illinois Society for Child Study
U. of Iowa Studies in Psychology . . . . . .
U. of Mont. Studies. . . . . .
West. Rev. . . . . Westminster Review
Yale Rev. . . . . .
Yale Psy. Lab. Studies . . Psychological Laboratory Studies
Zeit. f. ang. Psy. . . Zeitschrift für angewandte Psychologie
Zeit. f. Psy. u. Physiol. d. Sinnesorgane . . . . . Zeitschrift für Psychologie und Physiologie des Sinnesorgane
Zeit. f. pād Psy. u. exp. Pād . . . . . Zeitschrift für pädagogische Psychologie und experimentelle Pädagogik.

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